Vol. 982 Number 2

OFFICIAL GAZETTE

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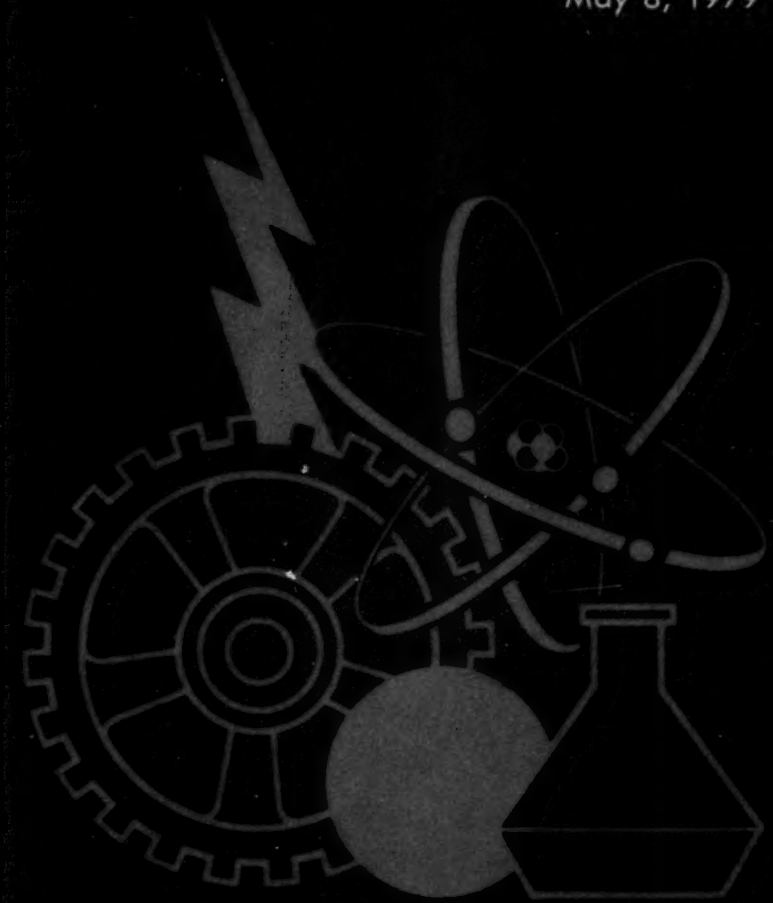
PATENTS

May 8, 1979



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May 8, 1979 Volume 982 Number 2

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information	982 OG 10
Patent Suits	982 OG 10
Reissue Applications Filed	982 OG 12
Patent Notices	
Certificates of Correction for the Week of May 8, 1979	982 OG 13
Notice of Proposed Removal From Register	982 OG 13
Adverse Decisions in Interferences	982 OG 13
Disclaimers	982 OG 14
Disclaimer and Dedication	982 OG 14
Dedication	982 OG 14
National Technical Information Service	982 OG 14
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	982 OG 16
Condition of Patent Applications	982 OG 17
Reissue Patents Granted (29,984)	393
Patents Granted	
General and Mechanical (4,152,782)	397
Chemical (4,153,412)	609
Electrical (4,153,812)	721
Design Patents Granted (251,756)	771
Index of Patentees	PI 1
Indices of Reissues and Designs	PI 43
Classification of	
Patents (Including Reissues)	PI 45
Designs	PI 47
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 48
Designs	PI 49
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT): Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.

Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

3,225,191, Industrial Dynamics Company, Ltd., INFRARED LIQUID LEVEL INSPECTION SYSTEM; **4,121,103,** same, CAUSTIC DETECTION SYSTEM, **filed** Nov. 19, 1978, D.C., C.D. Calif. (Los Angeles), Doc. 78–4350–F, *Industrial Dynamics Company, Ltd.* v. *Industrial Automation Corporation.*

3,489,498, Melpar, Inc., FLAME PHOTOMETRIC DETECTOR WITH IMPROVED SPECIFICITY TO SULFUR AND PHOSPHORUS, **filed** Feb. 28, 1977, D.C. Md. (Baltimore), Doc. H–77–291, *American Standard Inc. and Meloy Laboratories, Inc.* v. *Monitor Labs, Incorporated.* Case dismissed without prejudice with right to move to reopen within sixty days with each party bearing own costs, filed Feb. 22, 1979.

3,515,939, High Voltage Engineering Corp., DUST PRECIPITATOR, **filed** Apr. 19, 1976, D.C., W.D. Pa. (Pittsburgh), Doc. 76–515, *Westinghouse Electric Corporation and High Voltage Engineering Corp.* v. *I-T-E Imperial Corporation.* Case dismissed with prejudice, filed Feb. 22, 1979.

3,523,508, Louis Maslow, ADJUSTABLE SHELVING; **D. 215,773,** same, ADJUSTABLE SHELVING UNIT, **filed** Feb. 28, 1979, D.C., E.D.N.Y. (Brooklyn), Doc. 79C498, *Metropolitan Wire Corporation* v. *Beatrice Foods Co. (Inc.).*

3,566,667, William Kenneth Hagerty, MULTIDIRECTION POWER ACTUATED FORCE UNIT, **filed** Feb. 12, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–0569–RJK(Gx), *Kansas Jack, Inc.* v. *Charles J. Kuhn, doing business as Kuhn Manufacturing Company.* **Same, filed** Feb. 12, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–1560–RJK(Gx), *Kansas Jack, Inc.* v. *Charles J. Kuhn, doing business as Kuhn Manufacturing Company.*

3,577,241, American Beef Packers, Inc., METHOD OF PREPARING EDIBLE ANIMAL FEET, **filed** Dec. 15, 1978, D.C. Nebr. (Omaha), Doc. CV78–0–547, *American Beef Packers, Inc.* v. *Palamera Beef Corp.*

3,611,910, Ropat Corporation, CORN POPPER, **filed** Jan. 24, 1974, D.C., N.D. Ill. (Chicago), Doc. 74–207, *Ropat Corporation* v. *West Bend Company.* Case closed pursuant to order dated June 30, 1976.

3,612,125, Helmuth Krauth, CUTTING DEVICE, **filed** Mar. 1, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c802, *Stepham Machinery Corporation* v. *Hobart Corporation.*

3,633,774, William S. Lee, MOVING METHOD; **3,809,261,** same, MOVING SYSTEM, **filed** Sept. 8, 1978, D.C., W.D. Mo. (Kansas City), Doc. 78–0683–CV–W–2, *William S. Lee* v. *Clarence A. Baker.* Judgment in favor of plaintiff and against defendant, entered Feb. 27, 1979.

3,635,297, Roger F. Salava, POSTAGE CALCULATOR, **filed** July 9, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c2515, *Roger F. Salava et al.* v. *The Singer Company.* Stipulation of dismissal pursuant to Rule 41(a)(i) F.R.C.P., filed Dec. 11, 1978.

3,659,284, Sanders Associates, Inc., TELEVISION GAMING APPARATUS; **3,659,285,** same, TELEVISION GAMING APPARATUS AND METHOD, **filed** Apr. 15, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1030, *The Magnavox Company* v. *Bally Manufacturing Company et al.* Leave granted to plaintiff to propound interrogatories to defendant, filed June 1, 1977.

3,659,284, Sanders Associates, Inc., TELEVISION GAMING APPARATUS: **4,034,983,** Massachusetts Institute of Technology, ELECTRONIC GAMES, **filed** Mar. 2, 1979, D.C., S.D.N.Y., Doc. 79–C–1129 (LWP), *APF Electronics, Inc. et ano.* v. *The Magnavox Co. et al.*

3,659,285. (See 3,659,284.)

3,675,891, G. S. Reynolds et al., CONTINUOUS CATHETER FLUSHING APPARATUS, **filed** Feb. 26, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–0742 WPG, *Dyne Corporation et al.* v. *Sorenson Research Co., Inc.*

3,691,972, Reynolds Metals Company, ALUMINOUS METAL ARTICLES AND METHOD; **3,814,590,** same, ALUMINOUS METAL ARTICLES AND ALUMINUM BASE ALLOYS, **filed** Jan. 31, 1979, D.C., N.D. Calif. (San Francisco), Doc. C79–0188–WAI, *Kaiser Aluminum & Chemical Corporation* v. *Reynolds Metals Company.* **Same, filed** Feb. 13, 1979, D.C., N.D. Ind. (South Bend), Doc. S79–0029, *Reynolds Metals Company* v. *Kaiser Aluminum and Chemical Corporation and Kaiser Aluminum and Chemical Sales Inc.*

3,706,290, Frank J. Holland, SYSTEM FOR EXHAUSTING GASEOUS PRODUCTS OF COMBUSTION, **filed** Dec. 18, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c5015, *Frank J. Holland* v. *Encr-Trol Systems, Inc.*

3,707,930, American Hospital Supply Corporation, POWER-OPERATED PEDESTAL TABLE AND SAFETY CLUTCH THEREFOR; **3,888,444,** same, ADJUSTABLE SUPPORT COLUMN, **filed** Jan. 9, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c88, *American Hospital Supply Corporation* v. *Mayline Company Inc.*

3,708,836, Opti-Holding A.G., WARP-KNIT SLIDE FASTENER STRINGER; **3,762,002,** same, SLIDE-FASTENER STRINGER WITH KNIT TAPE, **filed** Nov. 25, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c4037, *Opti Beteiligunga- und Finanz-AG* v. *YKK Zipper (U.S.A.).* Cause dismissed without prejudice and with leave to reinstate within 6 months pursuant to stipulation, filed Dec. 28, 1977.

3,740,331, John R. Anderson and Charles O. Weiss, METHOD FOR PRECIPITATION OF HEAVY METAL SULFIDES, **filed** Jan. 5, 1979, D.C.N.J. (Trenton), Doc. C79—45, *The Permutit Company, Inc.* v. *Hussong-Walker-Davis Co.*

3,742,571, AMP Incorporated, APPARATUS FOR TRIMMING AND INSERTING WIRES; **3,766,622,** same, AUTOMATIC APPARATUS FOR ATTACHING WIRES TO TERMINALS, **filed** Oct. 31, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3147, *AMP Incorporated* v. *TRW, Inc.* Complaint and counterclaim dismissed without prejudice with each party to bear its own costs, ordered Oct. 5, 1977.

3,758,151, Dual Manufacturing and Engineering Inc., RECLINING CHAIR, **filed** Oct. 17, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2667, *Dual Manufacturing & Engineering Inc. et al.* v. *Burris Industries, Inc.* Order denying plaintiff's motion for attorney fee, dated Dec. 27, 1978.

3,762,002. (See 3,708,836.)

3,766,622. (See 3,742,571.)

3,792,133, Roy R. Goughnour, METHOD FOR SLIP-FORMING WALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION; **3,957,405,** same, SLIP FORM HAVING HINGED GATE MEANS; **4,014,633,** same, ADJUSTABLE SLIP FORM, **filed** Apr. 18, 1977, D.C., N.D. Ga. (Atlanta), Doc. C77–604, *A. C. Aukerman Co.* v. *Pittman Highway Contracting Co., Inc.* Consent dismissal, filed Feb. 23, 1979.

3,802,476, Illinois Tool Works Inc., SCREW ANCHOR, **filed** Feb. 15, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c0596, *Illinois Tool Works Inc.* v. *KL Spring & Stamping Corporation.*

3,802,627, Sterling Square Sprinkler Company, Inc., IRRIGATION APPARATUS; **3,902,668,** Valmont Industries, Inc., **filed** Apr. 28, 1978, D.C. Nebr. (Omaha), Doc. CV78–0–181, *Valmont Industries, Inc.* v. *Olson Bros. Mfg. Co.*

3,809,261. (See 3,633,774.)

3,814,590. (See 3,691,972.)

3,857,916, Lois I. Day, OXYGENATOR SUPPORT, **filed** Feb. 16, 1979, D.C., S.D. Ohio (Dayton), Doc. C–3–79–54, *Lois I. Day* v. *Water Cleaning, Inc.*

3,861,770, Gamco Industries, Inc., LOCK ASSEMBLY AND TOOL, **filed** Mar. 5, 1979, D.C.N.J. (Newark), Doc. 79–0701, *Gamco Industries, Inc.* v. *Gary Balsam et al.*

3,868,790, Roy A. Fricke, SPARK PLUG CLEANER; **4,028,851,** same; **4,062,155,** same, **filed** Feb. 23, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c712, *Wells Mfg. Corp.* v. *Roy A. Fricke and Elco International Limited.*

3,870,422, John J. Medico, Jr., POROUS PAVEMENT, **filed** Jan. 29, 1979, D.C., M.D. Fla. (Tampa), Doc. 79–128–C T.H., *Porous Concrete, Inc., John J. Medico, Jr. and Christine Medico* v. *Environmental Answers, Inc., Charles W. Cerrito and Harry Hodson.*

3,886,656, CBS, Inc., SWIVEL KNIFE; **Reg. No. 401,167,** (X-ACTO), same, **filed** Oct. 28, 1976, D.C.N.J. (Newark), Doc. 76–2060, *CBS, Inc.* v. *X-Po Instrument Company, Inc.* Order for permanent injunction and dismissing action as to remaining counts, etc., entered Jan. 18, 1979.

3,888,444. (See 3,707,930.)

3,892,363, Associated Mills, Inc., ATTACHMENT FOR HYDROTHERAPY BATH, **filed** May 11, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c1766, *Associated Mills, Inc.* v. *American Import Merchants et al.* Dismissal order, filed Mar. 13, 1979. **Same, filed** June 28, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76–2054–F, *Associated Mills, Inc.* v. *The Akron.* Stipulation and order thereon dismissing action with prejudice, entered Feb. 27, 1979.

3,902,668. (See 3,802,627.)

3,907,794, FMC Corporation, TREATMENT OF CHLORINATED ISOCYANURATE WASTE STREAMS, **filed** June 19, 1978, D.C., S.D. Miss. (Biloxi), Doc. S78–0186(R), *FMC Corporation* v. *EMCO Wheaton, Inc.*

3,912,255, George P. McInerny, STACKERS FOR DOCUMENT COUNTERS AND THE LIKE, **filed** June 27, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2573, *Brandt-Pra Inc.* v. *Cummins-Allison Corp.* Action dismissed with prejudice with each party to bear its own costs, filed Feb. 15, 1979.

3,921,358, GAF Corporation, COMPOSITE SHINGLE, **filed** Nov. 29, 1978, D.C., W.D. Okla. (Oklahoma City), Doc. C78–1293–T, *GAF Corporation* v. *Allied Materials Corporation and Allied Stroud Corporation.* Pursuant to Rule 41(a)(1) FRCP, action is discontinued and complaint dismissed, entered Jan. 9, 1979.

3,821,804, William W. Tester, MEDICATION DISPENSING PACKAGE, **filed** Dec. 22, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c5104, *William W. Tester* v. *Plastofilm Industries Inc.*

3,923,074, The Scott & Fetzer Company, ENCLOSABLE RETRACTABLE AWNING, **filed** Feb. 16, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–0659–RMT, *A & E Plastik Pak Co. Inc.* v. *The Scott & Fetzer Company.*

3,957,405. (See 3,792,133.)

3,959,915, John S. Kettlestrings, PROPELLED DISK COPTER TOY, **filed** Jan. 18, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c186, *Sunmark, Inc.* v. *John S. Kettlestrings.*

3,986,712, Kaiichi Hasegawa, FEEDING DEVICE FOR CARD COUNTING MACHINES, **filed** Feb. 13, 1979, D.C. Conn. (Bridgeport), Doc. B–79–57, *Abbott, Inc.* v. *Billcon Corporation of America, Inc.* **Same, filed** Mar. 5, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–0853, *Billcon Corporation of America* v. *Sam E. Hooper, doing business as Abbott Coin Counter Company.*

4,012,494, Abbott Laboratories, DIRECT RADIOIMMUNOASSAY FOR ANTIGENS AND THEIR ANTIBODIES, **filed** Feb. 14, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c575, *Abbott Laboratories* v. *Miles Laboratories, Inc.*

4,013,083, Edward Helbling, HAIR DRYER, **filed** Nov. 17, 1978, D.C.N.J. (Trenton), Doc. C78–2800, *Edward Helbling* v. *Conair Corp.* Stipulation of dismissal, filed Mar. 5, 1979.

4,014,006, Data General Corporation, DATA PROCESSING SYSTEM HAVING A UNIQUE CPU AND MEMORY TUNING RELATIONSHIP AND DATA PATH CONFIGURATION, **filed** Jan. 30, 1979, D.C. Mass. (Boston), Doc. C.A. 79–193–T, *Data General Corporation* v. *Ampex Corporation and Data National Corporation.*

4,014,633. (See 3,792,133.)

4,015,598, Glenn E. Brown, ANAESTHESIC SYSTEM, **filed** Feb. 21, 1979, D.C., W.D.N.Y. (Buffalo), Doc. 79–138, *Glenn E. Brown* v. *Fraser Sweatman Inc.*

4,028,851. (See 3,868,790.)

4,031,395, EMI Limited, RADIOGRAPHY; **4,035,651,** same, RADIOGRAPHY DEVICE WITH CIRCUITRY TO CORRECT FOR PHOTODETECTOR SENSITIVITY; **4,052,618,** same, APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **4,052,619,** same, METHOD AND APPARATUS FOR MEASURING AND ANALYZING RADIATION TRANSMITTED AT PLURAL ANGLES; **4,069,522,** same, APPARATUS FOR EXAMINING OBJECTS BY MEANS OF PENETRATING RADIATION, **filed** Feb. 21, 1978, D.C., N.D. Ohio (Cleveland), Doc. C78–172, *EMI Limited* v. *Ohio Nuclear, Inc.* All complaints and counterclaims are dismissed with prejudice with each party to bear its own costs, filed Mar. 6, 1979.

4,034,983. (See 3,659,284.)

4,035,651. (See 4,031,395.)

4,049,748, Wesley T. Bailey, UNSATURATED POLYESTERS COMBINED WITH ORGANOALUMINUM COMPOUNDS, **filed** Feb. 27, 1979, D.C., E.D. Tenn. (Chattanooga), Doc. C1–79–56, *Wesley T. Bailey* v. *Chattem Drug & Chemical Company.*

4,052,618. (See 4,031,395.)

4,052,619. (See 4,031,395.)

4,062,155. (See 3,868,790.)

4,067,071, Thermasol Ltd., BATHTUB, WALL AND CEILING LINER ASSEMBLY, **filed** Feb. 26, 1979, D.C. Mass. (Boston), Doc. 79–0390–C, *Thermasol Ltd.* v. *Universal Plastics Corporation and James R. Peters.*

4,069,422. (See 4,031,395.)

4,085,964, Ernest L. Hutto and Charles A. Tovey, VEHICLE INSECT PROTECTION APPARATUS, **filed** Feb. 9, 1979, D.C., M.D. Fla. (Tampa), Doc. 79–163–C T.R., *Ernest L. Hutto and Charles A. Tovey* v. *Jay Distributing, Inc.*

4,095,587, Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, HEALTHY MAGNETIC ORNAMENT; **D. 245,769,** same, MAGNETIC MEDICAL NECKLACE, **filed** June 22, 1978, D.C., C.D. Calif (Los Angeles), Doc. 78–2427, *Tokyo Denki Kagaku Kogyo Kabushiki Kaisha* v. *Bio Magnetic Corporation et al.*

4,105,521, Helena Laboratories Corporation, CLINICAL PROCEDURE FOR MEASURING LIPOPROTEIN CHOLESTEROLS, **filed** Jan. 22, 1979, D.C. Mass. (Boston), Doc. 79–152–S, *Corning Glass Works* v. *Helena Laboratories Corporation.*

4,108,176, Carl W. Walden, AUTOMATIC INJECTING APPARATUS, **filed** Jan. 29, 1979, D.C. Mass. (Boston), Doc. 79–186–MA, *Damon Corporation* v. *A. H. Robins, Inc.*

4,111,481, Edwin Lee Nix and Bobby E. Davenport, TRUCK BED LINER, **filed** Jan. 25, 1979, D.C., S.D. Tex. (Houston), Doc. C.A. H–79–175, *Plastics Unlimited, Inc., Edwin Lee Nix and Bobby E. Davenport* v. *Fred Davis, doing business as Davis Distributors.*

4,121,103. (See 3,225,191.)

4,125,902, Uniforms to You & Co., FITS ALL SIZES WRAP-AROUND GARMENT, **filed** Feb. 27, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3–79–0231–K, *Uniforms to You & Co.* v. *Action Line, Inc.*

4,128,177, Leggett & Platt, Incorporated, DISPLAY RACK WITH IMPROVED SHELF ASSEMBLY, **filed** Feb. 20, 1979, D.C., N.D. Ga. (Atlanta), Doc. C79–285A, *Leggett & Platt, Incorporated* v. *The Mead Corporation.*

4,138,132, Keith H. Doyle, PROTECTIVE COVERS FOR MOTORCYCLE LOWER FORK CASES AND METHOD OF MAKING SAME, **filed** Feb. 12, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–0580, *Keith H. Doyle* v. *CH Performance Products and Stanley A. Doerr.*

D. 215,773. (See 3,523,508.)

D. 219,871, American Racing Equipment, WHEEL, **filed** Jan. 31, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–0404–RJK(Px), *Art Hale, Inc.* v. *Republic International Manufacturing Company.*

D. 243,893, Trend Line Furniture Corporation, SOFA, **filed** Feb. 23, 1979, D.C. Mass. (Boston), Doc. 79–0379–C, *Trend Line Furniture Corporation* v. *Eastern Furniture Manufacturers, Inc.*

D. 245,299, Paul Beck, WALL MOUNTED RACK FOR BEER CANS OR THE LIKE, **filed** Jan. 17, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c154, *G. Pierce Toy Mfg. Co. Inc.* v. *Classic Products, Inc.* Motion of plaintiff for summary judgment granted on ground that plaintiff's Can Collector panel does not infringe Beck Design Patent No. 245,299. Motion of defendant for dismissal of complaint with prejudice denied, order dated May 23, 1978.

D. 245,769. (See 4,095,587.)

D. 251,161, Roth American Inc., CHILD'S ROLL-TOP DESK OR SIMILAR ARTICLE, **filed** Mar. 6, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c0884, *Roth American Inc.* v. *American Toy & Furniture Co., Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,540,323, Re. S.N. 008,896, Filed Feb. 2, 1979, Cl. 408/186, DRILL HAVING INDEXABLE CARBIDE INSERTS, Everett D. Rishel, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Ralph E. Walters, et al., Ex. Gp.: 324

3,962,238, Re. S.N. 015,752, Filed Feb. 27, 1979, Cl. 544/165, AN ETHER OF N PROPANOL AMINE, Norbert Busch, et al., Owner of Record: *Centre European de Recherches Mauvernay CERM, Riom, France,* Attorney or Agent: Eric H. Waters, Ex. Gp.: 121

4,068,929, Re. S.N. 015,644, Filed Feb. 27, 1979, Cl. 350/215, HIGH SPEED FOCUSING TELEPHOTO LENS, Hideo Yokota, Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Gerald H. Kiel, Ex. Gp.: 257

4,093,395, Re. S.N. 003,706, Filed Jan. 15, 1979, Cl. 408/224, DRILL AND COMBINED DRILL COUNTERSINK, William K. Luebbert, et al., Owner of Record: *McDonnell Douglas Corporation, St. Louis, Mo.,* Attorney or Agent: Walter J. Jason, et al., Ex. Gp.: 324

4,111,535, Re. S.N. 017,430, Filed Mar. 5, 1979, Cl. 351/160, GAS PERMEABLE LENS, Samuel Loshaek, et al., Owner of Record: *Wesley-Jessen Inc., Chicago, Ill.,* Attorney or Agent: John L. Sigalos, et al., Ex. Gp.: 257

PATENT AND TRADEMARK OFFICE NOTICES

Certificates of Correction for the Week of May 8, 1979

Re. 29,755	4,100,496	4,119,548	4,132,983
Re. 29,882	4,100,709	4,119,892	4,133,111
Re. 29,886	4,101,503	4,120,344	4,133,222
3,770,567	4,101,572	4,120,515	4,133,254
3,858,262	4,101,744	4,120,594	4,133,319
3,861,102	4,101,815	4,120,911	4,133,354
3,865,869	4,102,472	4,120,976	4,133,501
3,869,463	4,102,669	4,120,987	4,133,901
3,922,448	4,103,463	4,121,523	4,134,072
3,929,929	4,103,572	4,121,764	4,134,263
4,000,114	4,104,523	4,122,804	4,134,553
4,007,444	4,104,917	4,122,871	4,134,627
4,020,022	4,105,557	4,122,899	4,134,636
4,030,007	4,105,628	4,123,415	4,134,824
4,044,518	4,105,640	4,123,776	4,135,045
4,049,289	4,105,945	4,123,841	4,135,204
4,059,460	4,106,281	4,124,940	4,135,275
4,063,642	4,106,298	4,125,469	4,135,277
4,067,277	4,106,888	4,125,522	4,135,443
4,070,680	4,107,051	4,125,578	4,135,478
4,071,500	4,107,757	4,126,267	4,135,508
4,072,714	4,108,257	4,126,647	4,135,511
4,082,762	4,109,052	4,127,461	4,135,692
4,084,881	4,109,181	4,127,499	4,135,899
4,085,225	4,109,663	4,127,578	4,136,042
4,089,504	4,109,856	4,127,601	4,136,807
4,089,621	4,110,134	4,127,636	4,136,853
4,090,064	4,110,299	4,128,186	4,136,879
4,092,749	4,110,449	4,128,502	4,136,937
4,093,447	4,110,611	4,128,511	4,136,978
4,093,704	4,110,910	4,128,553	4,137,058
4,093,795	4,111,243	4,128,557	4,137,135
4,094,161	4,111,295	4,128,758	4,137,427
4,094,752	4,111,712	4,129,910	4,137,445
4,095,029	4,111,970	4,129,987	4,138,097
4,095,493	4,112,204	4,130,015	4,138,211
4,095,643	4,112,357	4,130,064	4,138,265
4,096,234	4,113,270	4,130,502	4,138,394
4,096,517	4,113,565	4,130,504	4,138,398
4,097,252	4,114,442	4,130,808	4,138,422
4,097,462	4,114,883	4,131,296	4,138,870
4,097,520	4,115,332	4,131,454	4,138,885
4,097,521	4,115,334	4,131,630	4,139,172
4,097,833	4,115,657	4,131,633	4,139,254
4,097,880	4,116,127	4,131,940	4,139,327
4,098,211	4,116,608	4,131,980	4,139,346
4,098,256	4,117,213	4,132,135	4,140,333
4,098,400	4,117,460	4,132,286	4,140,686
4,098,535	4,117,599	4,132,350	4,140,813
4,098,704	4,117,984	4,132,366	4,140,923
4,099,140	4,118,440	4,132,583	4,141,202
4,099,214	4,118,574	4,132,615	4,142,213
4,100,117	4,119,298	4,132,722	4,144,310

Notice of Proposed Removal From Register

Pursuant to the provisions of 37 C.F.R. 1.347, a letter was directed on March 19, 1979, to Mr. Alan McCartney at 610 Fenton Building, Jamestown, N.Y. 14757, the last post office address furnished by him to the Committee on Enrollment. The letter was returned by the Post Office marked "Moved, not forwardable."

Mr. McCartney is being given thirty days from the date of this notice to inform the Patent & Trademark Office Committee on Enrollment whether he desires to remain on the register.

Failure to comply fully with this request within the 30-day period will result in the removal of his name from the register of attorneys.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Mar. 28, 1979.

Adverse Decisions in Interferences

In the designated intereferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,381,848, O. L. Brown, EASY-OPENING CAN END, Interference No. 96,726, decided Aug. 14, 1978, claims 1–4.

Patent No. 3,615,796, H. G. Schreuders, ANIONIC QUICK-SET ASPHALT EMULSION, Interference No. 99,967, decided Dec. 8, 1978, claims 1 and 3.

Patent No. 3,714,898, R. T. Ziemba, FUZE ACTUATING SYSTEM, Interference No. 98,602, decided Dec. 12, 1978, claim 5.

Patent No. 3,763,905, D. D. Hamilton, J. J. R. Boivin and D. Benedetto, TREE HARVESTER, Interference No. 99,348, decided Oct. 30, 1978, claims 1–5.

Patent No. 3,786,344, W. F. Davis, R. W. Russell, T. M. Frederiksen and E. L. Long, VOLTAGE AND CURRENT REGULATOR WITH AUTOMATIC SWITCHOVER, Interference No. 98,703, decided July 24, 1978, claims 1, 7 and 9.

Patent No. 3,874,932, Y. Uetani, R. Ikebata, T. Togo and T. Iwamaru, DRY CELLS, Interference No. 99,506, decided Dec. 5, 1978, claims 1–6 and 12–17.

Patent No. 3,878,085, J. F. Corbani, CATHODE SPUTTERING APPARATUS, Interference No. 99,268, decided Oct. 18, 1978, claim 7.

Patent No. 3,905,963, J. A. Webber, PROCESS FOR PREPARING PRIMARY 3–CARBAMOYLOXYMETHYL CEPHALOSPORINS, Interference No. 99,643, decided Jan. 24, 1979, claim 3.

Patent No. 3,925,368, R. D. G. Cooper and D. K. Herron, ACYLUREIDO SUBSTITUTED CEPHALOSPORINS, Interference No. 99,733, decided Jan. 10, 1979, claims 1, 2 and 3.

Patent No. 3,950,427, W. Engel, J. Nickl, H. Teufel, G. Engelhart, E. Seeger and G. Trummlitz, ARALIPHATIC KETONES AND CARBINOLS, Interference No. 99,740, decided Feb. 23, 1979, claims 1 and 5.

Patent No. 3,965,635, J. S. Renkert, PREFABRICATED BUILDING PANEL AND METHOD OF MAKING, Interference No. 99,689, decided Jan. 5, 1979, claim 1.

Patent No. 3,966,322, G. S. Greaves, I. Deverill and R. A. Bunce, DEVICE FOR USE IN PRODUCING A SCANNING BEAM OF RADIATION AND APPARATUS FOR USE IN INVESTIGATING SPECIMENS, Interference No. 99,878, decided Feb. 22, 1979, claims 1–3.

Patent No. 3,975,523, H. Hoffmann, I. Hammann and B. Homeyer, O - (2-CARBISOPROPOXYPHENYL) - THIONOPHOSPHORIC (PHOSPHONIC) ACID ESTER-AMIDES AND ESTER-IMIDES AND INSECTICIDAL AND ACARICIDAL COMPOSITION AND METHOD, Interference No. 99,630, decided Jan. 11, 1979, claims 1, 7 and 8.

Patent No. 3,982,226, W. H. Bunker and J. A. Rodriguez, MEANS AND METHOD FOR ERROR DETECTION AND CORRECTION OF DIGITAL DATA, Interference No. 99,837, decided Jan. 10, 1979, claims 1–12.

Patent No. 4,000,181, M. Elliott, N. F. Janes and D. A. Pulman, ALPHA-CYANO-PHENOXYBENZYL CYCLOPROPANE CARBOXYLATE INSECTICIDES, Interference No. 99,821, decided Jan. 9, 1979, claim 1.

Patent No. 4,008,066, H. Moser, PHENYLAMINOACETAMIDES FOR REGULATING PLANT GROWTH, Interference No. 99,620, decided Oct. 17, 1978, claims 1, 3, 7, 16, 17 and 20.

Patent No. 4,027,356, R. C. Wagner and R. A. Banike, MEAT TENDERIZER, Interference No. 99,885, decided Jan. 18, 1979, claims 1–4, 6 and 10.

Patent No. 4,029,772, C. P. Dorn and S. S. Yang, PEPTIDE CARBAZATES, Interference No. 99,945, decided Jan. 26, 1979, claim 1.

Patent No. 4,034,082, E. S. Johnson and W. F. White, METHOD TO PREVENT REPRODUCTION IN WARM-BLOODED FEMALE ANIMALS WITH NONAPEPTIDES, Interference No. 99,975, decided Jan. 9, 1979, claims 1, 3, 5, 6 and 7.

Disclaimers

3,414,514.—*Frank C. Buhl*, Birmingham, Mich. PROCESS OF DEWATERING A CONCENTRATED SEWAGE SLURRY. Patent dated Dec. 3, 1968. Disclaimer filed Feb. 9, 1979, by the assignee, *Hercules Incorporated*.

Hereby enters this disclaimer to claims 1–9 of said patent.

3,439,596.—*Dean M. Peterson, William Windle, Jr.*, and *Charles E. Pickering*, Rochester, N.Y. RETRACTILE LENS CAMERA WITH AUTOMATIC EXPOSURE CONTROL SYSTEM AND BATTERY PRESERVING SWITCH. Patent dated Apr. 22, 1969. Disclaimer filed Feb. 22, 1979, by the assignee, *Eastman Kodak Company*.

Hereby enters this disclaimer to claims 1, 3 and 5 of said patent.

3,470,694.—*Tadeusz Budzich*, Moreland Hills, Ohio. FLOW PROPORTIONAL VALVE FOR LOAD RESPONSIVE SYSTEM. Patent dated Oct. 7, 1969. Disclaimer filed Feb. 21, 1979, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 3, 4 and 7 of said patent.

3,760,192.—*John O. G. Darrow*, Murrysville, Pa. FAIL SAFE LEVEL DETECTOR. Patent dated Sept. 18, 1973. Disclaimer filed Feb. 27, 1979, by the assignee, *Westinghouse Electric Corporation*.

Hereby enters this disclaimer to claims 1–7 of said patent.

3,785,424.—*Sigurad A. Rishovd*, Minneapolis, Minn. TIRE BEAD SEATER. Patent dated Jan. 15, 1974. Disclaimer filed Mar. 21, 1979, by the assignee, *B & J Manufacturing Company*.

Hereby enters this disclaimer to claims 1, 2, 5, 10, 12–16 and 19 of said patent.

3,925,309.—*Lewis B. Weisfeld*, Princeton, N.J. and *Robert C. Witman*, Cincinnati, Ohio. DIMETHYLTIN ESTERS. Patent dated Dec. 9, 1975. Disclaimer filed Jan. 24, 1979, by the assignee, *Cincinnati Milacron Chemicals, Inc.*

Hereby enters this disclaimer to claims 1 to 6 and 8 to 13 of said patent.

3,953,869.—*Allen Kwok Wah Lo*, Atlanta, and *Jerry Curtis Nims*, Dunwoody, Ga. STEREOSCOPIC PHOTOGRAHY APPARATUS. Patent dated Apr. 27, 1976. Disclaimer filed Feb. 9, 1979, by the assignee, *Nimslo Technology, Inc.*

Hereby enters this disclaimer to claims 11 to 15, inclusive of said patent.

3,989,340.—*Luther M. Sheldon*, Cranston, and *Robert E. Maloof*, East Greenwich, R.I. INSULATOR RAMP CLAMP FOR CONNECTORS. Patent dated Nov. 2, 1976. Disclaimer filed Jan. 24, 1979, by the assignee, *General Electric Company*.

Hereby enters this disclaimer to claims 1 through 7 of said patent.

4,088,689.—*Michael Rosenberger*, Caldwell, N.J. CYCLOHEXENONE PHOSPHONIUM SALTS. Patent dated May 9, 1978. Disclaimer filed Feb. 5, 1979, by the assignee, *Hoffmann-La Roche Inc.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

4,117,375.—*Gerald Bachur*, San Jose, and *George E. Richardson*, Santa Clara, Calif. EXPOSURE SYSTEM. Patent dated Sept. 26, 1978. Disclaimer filed Nov. 9, 1978, by the assignee, *Optical Associates, Inc.*

The term subsequent to May 17, 1994 has been disclaimed.

4,126,635.—*William J. Welstead, Jr.*, and *Henry W. Moran*, Richmond, Va. 2-AMINO-3-(5- AND 6-) BENZOYLPHENYLACETIC ACIDS, ESTERS and METAL SALTS THEREOF. Patent dated Nov. 21, 1978. Disclaimer filed Feb. 5, 1979, by the assignee, *A. H. Robins Company, Incorporated*.

The term subsequent to Aug. 30, 1994 has been disclaimed.

Dedication

3,122,410.—*Curt Mueller*, Basel, and *Urs Lerch*, Neu-Allschwil, Switzerland. PROCESS FOR THE DYEING, PADDING AND PRINTING OF POLYESTER FIBERS. Patent dated Feb. 25, 1964. Dedication filed Feb. 23, 1979, by the assignee, *Saul & Co.*

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimer and Dedication

4,105,818.—*William R. Scholle*, Corona del Mar, Calif. GAS BARRIER PACKAGING MATERIAL. Patent dated Aug. 8, 1978. Disclaimer and Dedication filed Feb. 12, 1979, by the assignee, *Scholle Corporation*.

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

National Technical Information Service

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

CHIEF, INTELLECTUAL PROPERTY DIVISION, OTJAG
Department of the Army, Room 2D 444, Pentagon
Washington, D.C. 20310

Patent application 914,099, Infrared Semiconductor Device with Superlattice Region. Filed June 9, 1978.

Patent application 914,101, Controlled Absorption in Heterojunction Structures. Filed June 9, 1978.

Patent application 937,387, Metal Impregnated Graphite Fibers and Method of Making Same. Filed Aug. 28, 1978.

Patent 4,082,965, High Voltage Pulser. Filed Dec. 27, 1976. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,086,511, Millimeter Imaging Device. Filed Mar. 25, 1977. Patented Apr. 25, 1978. Not available NTIS.

Patent 4,090,140, Constant Current Charging Circuits for High Energy Modulators. Filed Jan. 17, 1977. Patented May 16, 1978. Not available NTIS.

Patent 4,091,325. Verification Technique for Checking Wrapped Wire Electronic Boards. Filed Feb. 8, 1977. Patented May 23, 1978. Not available NTIS.

Patent 4,091,901. Pump Lock-up Power Transmission. Filed Nov. 17, 1976. Patented May 30, 1978. Not available NTIS.

Patent 4,093, 784. Lithium Primary Cell. Filed Aug. 26, 1977. Patented June 6, 1978. Not available NTIS.

Patent 4,095,145. Display of Variable Length Vectors. Filed Dec. 13, 1976. Patented June 13, 1978. Not available NTIS.

Patent 4,091,327. Broadband Isotropic Antenna with Fiber-optic Link to a Conventional Receiver. Filed Mar. 2, 1977. Patented May 23, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half Street, SW., Washington, D.C. 20324

Patent 4,098,659. Electrochemical Milling Process to Prevent Localized Heating. Filed July 13, 1977. Patented July 4, 1978. Not available NTIS.

Patent 4,100,044. Procedure for Removing Aluminum from an Al-Al3Ni Two-Phase Matrix. Filed July 15, 1977. Patented July 11, 1978. Not available NTIS.

Patent 4,102,207. Electromagnetic Ultrasound Transducer. Filed Dec. 16, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,103,144. Low Inductance Heater Configuration for Solid State Devices and Microcircuit Substrates. Filed Nov. 24, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,103,339. Acoustic Surface Wave Bubble Switch. Filed Apr. 22, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,120,266. Subhuman Primate Restraint System. Filed Dec. 23, 1976. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,120,900. Fluorocarbon Bis(O-Aminophenol) Compounds Containing a Hydrocarbon Moiety. Filed Dec. 1, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,120,904. Synthesis of Fluorotrinitromethane. Filed May 26, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,121,002. Fabrication of Antenna Windows. Filed July 6, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,121,050. Differential Tri-Phase Shift Keyed Modulation. Filed Feb. 2, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,121,056. Time Division Digital Multiplexer Apparatus. Filed June 14, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,122,537. Magnetic Bubble Crossover Circuit. Filed Oct. 5, 1976. Patented Oct. 24, 1978. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Service Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

Patent application 891,998. Treatment of Cured Meat Products. Filed Mar. 31, 1978.

Patent 4,105,397. Bark Burning System. Filed Jan. 10, 1977. Patented Aug. 8, 1978. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20205

Patent application 931,273. Fluorescent Dyes for Intracellular Labelling. Filed Aug. 4, 1978.

Patent application 945,131. Mechanical Device to Produce a Finely Dispersed Aerosol. Filed Sept. 25, 1978.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent application 907,087. Quick Disconnect Intercell Busbar for Deep Submergence Batteries. Filed May 18, 1978.

Patent application 910,249. Coaxial Wet Connector with Spring Operated Piston. Filed May 30, 1978.

Patent application 930,283. Optical Heterodyne System for Imaging in a Dynamic Diffusive Medium. Filed Aug. 2, 1978.

Patent application 942,006. Magnetoresistive Power Amplifier. Filed Sept. 13, 1978.

Patent application 945,719. Niobium-Base Alloy. Filed Sept. 25, 1978.

Patent application 946,986. Electron Collector for Forming Low-Loss Electron Images. Filed Sept. 29, 1978.

Patent application 949,282. Method of Polishing Cadmium Sulfide Semiconductors. Filed Oct. 5, 1978.

Patent application 949,328. Incoherent Optical Ambiguity Function Generator. Filed July 10, 1978.

Patent application 951,907. 2-Keto-4,6,8,8-Tetramethyl-8,9-Dihydro-2H-Pyrano-(3,2-g) Quinoline, a New Blue-Green Laser Dye. Filed Oct. 16, 1978.

Patent application 955,427. Ambulator Control Circuitry. Filed Oct. 27, 1978.

Patent application 955,434. Remote Controlled Safety Hook. Filed Oct. 27, 1978.

Patent 4,038,900. Explosive Closure Valve. Filed July 19, 1976. Patented Aug. 2, 1977. Not available NTIS.

Patent 4,087,158. Low-Loss Single Filament Fiber Optic Connector with Three Concentric Tapered Members for Each Filaments. Filed Dec. 6, 1976. Patented May 2, 1978. Not available NTIS.

Patent 4,092,858. Oceanographic Sensor with In-Situ Cleaning and Bio-Fouling Prevention System. Filed Mar. 11, 1977. Patented June 6, 1978. Not available NTIS.

Patent 4,101,497. Sealant-Primer Coating. Filed Dec. 3, 1976. Patented July 18, 1978. Not available NTIS.

Patent 4,104,452. Vinyl Polymer-Fluoroalkylether Oligomer Composition. Filed Oct. 6, 1977. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,106,206. Positively Expandable and Retractable Thread Measuring Gage. Filed Apr. 25, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,107,946. Low Heat Loss Liquid Helium Disconnect Attachment and System. Filed May 3, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,108,046. Liquid-Gas Constant Force Recoil Spring. Filed June 6, 1975. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,115,167. Castable Binder for Cast Plastic-Bonded Explosives. Filed Nov. 11, 1974. Patented Sept. 19, 1978. Not available for NTIS.

Patent 4,115,999. Use of High Energy Propellant in Gas Generators. Filed Mar. 13, 1975. Patented Sept. 26, 1978. Not available NTIS.

Patent 3,503,814. Pyrotechnic Composition Containing Nickel and Aluminum. Filed May 3, 1968. Patented Mar. 31, 1970. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

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	Sacramento: California State Library	(916) 323-4572
	Sunnyvale Patent Library*	(408) 736-0795
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Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 10, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-7-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-15-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-23-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-28-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	10-12-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	10-26-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-26-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-26-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-1-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-2-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-18-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-1-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-17-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	11-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during March 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,023,412 to 3,027,557, inclusive
Plant Patents..... Numbers 2,133 to 2,134, inclusive

REISSUES

MAY 8, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

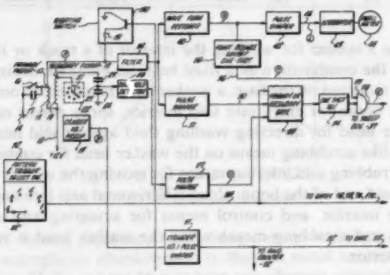
Re. 29,984
ENGINE IGNITION AND POWER ANALYZER

Peter A. Howes, La Verne, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Original No. 3,650,149, dated Mar. 21, 1972, Ser. No. 792,382, Jan. 21, 1969. Application for reissue Feb. 4, 1977, Ser. No. 765,614

Int. Cl.[2] **G01M** *15/00*

U.S. Cl. 73—117.3 **48 Claims**



1. In an apparatus for analyzing the operation of a multiple cylinder internal combustion engine having an ignition time interval for each cylinder during which ignition normally occurs, the combination which comprises:

means coupled to the engine for generating a first control pulse in response to the ignition time interval for each of the cylinders,

means responsive to each occurrence of the first control pulse for providing a second control pulse which is delayed from the occurrence of the first control pulse by an amount which is directly proportional to the interval between the successive times of cylinder ignition,

means responsive to each occurrence of the second control pulse for generating anticipatory ignition suppression signals in advance of the ignition times in respective cylinders, and

means coupled to the engine and responsive to the ignition suppression signals for suppressing the ignition in a selected cylinder.

Re. 29,985
SPRAG CLUTCHES

Edward J. Brownhill, Cheadle; Roy Heaton, Timperley, and Ralph Booth, Cheadle, all of England, assignors to Renold Limited, Manchester, England

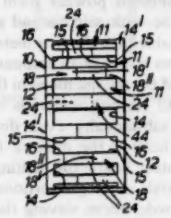
Original No. 3,952,849, dated Apr. 27, 1976, Ser. No. 576,654, May 12, 1975. Application for reissue Dec. 20, 1977, Ser. No. 862,764

Claims priority, application United Kingdom, May 28, 1974, 23531/74

Int. Cl.[2] **F16D** *41/07*

U.S. Cl. 192—41 A **12 Claims**

1. In a sprag retainer assemblage for use in an annular gap defined between confronting cylindrical surfaces of inner and outer races of a sprag clutch to transmit uni-directional drive between the clutch driving and driven race, the assemblage comprising an annular sprag retainer, a ring of sprags in the retainer, and for each sprag, an energising spring individual to the sprag and comprising a spring arm for biasing the sprag into substantially line contact with the inner race of the clutch, by tilting the sprag about substantially a line of contact with the outer race of the clutch, an improved sprag retainer comprising axially extending bars having first lengthwise portions presenting sprag positioning faces acting to position the sprags circumferentially with respect to one another, and wherein each energising spring has a mounting portion at least in part enwrapping a further lengthwise portion of one of the bars, the mounting portion thereby mounting the energising spring



fixedly on the bar, *and the retainer is formed in two identical annular parts which are joined together, the springs of each pair of adjacent energising springs being mounted one on one of the annular parts of the retainer and the other on the other of the annular parts of the retainer.*

Re. 29,986
ELECTRICAL CONTACT MATERIAL AND PROCESS

Terrence A. Davies, Encino, Calif., and David J. Pedder, Oxford, England, assignors to Square D Company, Park Ridge, Ill.

Original No. 4,011,052, dated Mar. 8, 1977, Ser. No. 620,909, Oct. 8, 1975. Continuation-in-part of Ser. No. 387,884, Aug. 13, 1973, abandoned, and a continuation-in-part of Ser. No. 340,440, Mar. 12, 1973, abandoned. Application for reissue Dec. 23, 1977, Ser. No. 863,543

Claims priority, application United Kingdom, Mar. 15, 1972, 12189/72; Aug. 18, 1972, 38568/72; Aug. 25, 1972, 39667/72

Int. Cl.[2] **B22F** *3/00;* **H01H** *1/02*

U.S. Cl. 75—234 **58 Claims**

1. A process of improving material used in manufacturing electrical contacts for electrical power applications and made with a first starting material selected from a group essentially consisting of a first metal in powder form and reducible compounds of the first metal in powder form both having a selected maximum particle size, and with a second starting material selected from a group essentially consisting of a second metal in powder form, reducible compounds of the second metal in powder form, and mixtures of the second metal in powder form all having a selected maximum particle size with said second metal selected to be more readily oxidizable than the first metal under similar environmental conditions and added in an amount from a minimum effective amount up to the maximum limit of solubility of the second metal in the first metal by mixing the first and second starting materials together to obtain a mixture having a substantially even dispersion of the first and second starting materials; heating the mixture in a reducing atmosphere at a temperature below the melting temperature [of the alloy] of the alloy of the first and second metals in the proportions present to alloy the first and second metals in a powder form; sieving the alloyed mixture to produce a selected maximum particle size; heating the sieved mixture in an oxidizing atmosphere at a temperature and under conditions selected to substantially completely oxidize the second metal and with said temperature below the melting temperature of the alloy of the first and second metals in the proportions present to thereby maintain the mixture in a powder form; and sieving the oxidized mixture to produce a selected maximum particle size, said process comprising:

adding at a selected time during the process *a compound which is convertible to an oxide of a third metal or* an oxide of a third metal selected from a group consisting of the metals in group IA and IIA of a periodic table *to provide a contact material having the oxides of the second and the third metals uniformly distributed throughout the material.*

29. An electrical contact for electrical power level applications comprising a material produced by an improved process using a first starting material of a first metal in an uncombined or combined powder form having a maximum selected particle size and a second starting material of a second metal in an uncombined or combined powder form having a maximum selected particle size with said second metal selected to be more readily oxidizable than the first metal under similar environmental conditions added in an amount up to the maximum limits of solubility of the second metal in the first metal; mixing the first and second starting materials together to obtain a mixture having a substantially even dispersion of the two starting materials; heating the mixture in a reducing atmosphere at a temperature below the melting temperature of the alloy of the two metals in the proportions present to alloy the two metals in a powder form; sieving the alloyed mixture to produce a selected maximum particle size; heating the sieved mixture in an oxidizing atmosphere at a temperature and under conditions selected to substantially completely oxidize the second metal and with said temperature below the melting temperature of the alloy of the two metals in the proportions present to maintain the mixture in a powder form; and sieving the oxidized mixture to produce a powder having a maximum selected particle size, wherein said improved process comprises:

adding at a selected time during the processs *a compound which is convertible to an oxide of a third metal or* an oxide of a third metal selected from a group consisting of the metals in groups IA and IIA of a periodic table *to provide a contact material having the oxides of the second and the third metals uniformly distributed throughout the material.*

58. A process of improving material used in manufacturing electrical contacts for electrical power applications and made with a first starting material selected from a group essentially consisting of a first metal in powder form and reducible compounds of the first metal in powder form both having a selected maximum particle size, and with a second starting material selected from a group essentially consisting of a second metal in powder form, reducible compounds of the second metal in powder form, and mixtures of the second metal in powder form all having a selected maximum particle size with said second metal selected to be more readily oxidizable than the first metal under similar environmental conditions and added in an amount from a minimum effective amount up to the maximum limit of solubility of the second metal in the first metal by mixing the first and second starting materials together to obtain a mixture having a substantially even dispersion of the first and second starting materials; heating the mixture in a reducing atmosphere at a temperature below the melting temperature of the alloy of the first and second metals in the proportions present to alloy the first and second metals in a powder form; sieving the alloyed mixture to produce a selected maximum particle size; heating the sieved mixture in an oxidizing atmosphere at a temperature and under conditions selected to substantially completely oxidize the second metal and with said temperature below the melting temperature of the alloy of the first and second metals in the proportions present to thereby maintain the mixture in a powder form; and sieving the oxidized mixture to produce a selected maximum particle size, said process comprising:

adding by precipitation at a selected time during the process a compound which is convertible to an oxide of a third metal or an oxide of a third metal selected from a group consisting of the metals in group IA and IIA of a periodic table to provide a contact material having the oxides of the second and the third metals uniformly distributed throughout the material.

Re. 29,987

APPARATUS AND METHOD FOR WASHING INTERIORS OF TRUCK AND TRAILER BODIES

Clyde O. Crandall, Pleasanton, and Charles Douglas, Oceanside, both of Calif., assignors to Safeway Stores, Incorporated, Oakland, Calif.

Original No. 3,961,983, dated Jun. 8, 1976, Ser. No. 535,287, Dec. 23, 1974. Application for reissue Apr. 25, 1977, Ser. No. 790,494

Int. Cl.[2] B60S *1/00*

U.S. Cl. 134—8 **15 Claims**

1. In a system for washing the interior of a truck or trailer body, the combination of a fixed base, an elongate horizontal boom mounted on the base, a washer head mounted on one end of the boom for entry into said interior, spray means on the washer head for directing washing fluid against said interior, brush-like scrubbing means on the washer head for contacting and scrubbing said interior, means for moving the washer head with said end of the boom along a horizontal axis into and out of the interior, and control means for actuating said spray means and scrubbing means when the washer head is within the interior.

Re. 29,988

PROCESS AND DEVICE FOR MAKING FABRICS WITH NON-WOVEN PILE

Jean J. Hospied, Dottignies, Belgium, assignor to A. F. Stoddard & Co., Ltd., Johnstone, Scotland

Original No. 3,691,069, dated Sep. 12, 1972, Ser. No. 135,262, May 19, 1971. Continuation of Ser. No. 584,249, Oct. 4, 1966, abandoned. Application for reissue Apr. 30, 1973, Ser. No. 355,695

Claims priority, application Belgium, Oct. 11, 1965, 670784

Int. Cl.[2] D04H *11/04*

U.S. Cl. 156—72 **5 Claims**

1. A process for manufacturing fabrics with non-woven pile such as carpets and velvet comprising coating on one side only two continuous support bands with a layer of adhesive; displacing these support bands in a passage in which they lie substantially parallel to one another at a predetermined distance from one another so that the adhesive layer carried by one of the support bands faces the layer carried by the other support band; feeding at least one continuous element to the passage; alternately prefolding the continuous element with a flexible bladelet to displace the continuous element adjacent the adhesive support band; alternately driving the pre-folded continuous element by folder blades against the adhesive layers carried by the support bands when the latter are displaced at the entrance to the passage in such a manner as to apply the continuous element alternately against these adhesive layers and to fold it zigzag, each folder blade being in contact with the continuous element during said driving, at a point fairly distant from the fold which has just been formed, and at a distance approximately equal to the separation of the adhesive layers situated in the passage, the distance between the contact point and the previous fold being measured along the element and in the longitudinal direction thereof, ensuring the hold of at least one of the adhesive layers and separating the support bands from one another.

Re. 29,989

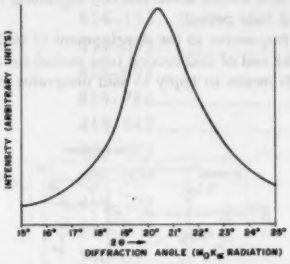
CUTTING BLADES MADE OF OR COATED WITH AN AMORPHOUS METAL

Donald E. Polk, Boston, Mass., and Robert C. Morris, Ledgewood, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Original No. 3,871,836, dated Mar. 18, 1975, Ser. No. 317,039, Dec. 20, 1972. Application for reissue Mar. 15, 1977, Ser. No. 777,971

Int. Cl.[2] **B26B** *21/54;* **B32B** *15/00*

U.S. Cl. 428—661 **11 Claims**



1. A cutting implement comprising a metal which is at least 50% amorphous, characterized in that the metal has the composition M_aX_b, where M is at least one element selected from the group consisting of Ni, Fe, Co, Cr and V, X is at least one element selected from the group consisting of P, B, C, Si, Al, Sb, Sn, In, Ge and Be, a ranges from 65 atomic percent to 90 atomic percent and b ranges from 10 atomic percent to 35 atomic percent.

Re. 29,990

PROCESSES FOR STEREOSPECIFICALLY PREPARING CHIRAL 2-SUBSTITUTED-4-HYDROXY-2-CYCLOPENTEN-1-ONE

Charles J. Sih, Madison, and James B. Heather, Middleton, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Original No. 3,968,141, dated Jul. 6, 1976, Ser. No. 478,713, Jun. 12, 1974. Continuation of Ser. No. 309,766, Nov. 27, 1972, abandoned. Application for reissue Nov. 4, 1977, Ser. No. 848,618

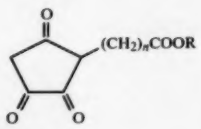
Int. Cl.[2] **C07C** *51/00, 61/38*

U.S. Cl. 560—121 **9 Claims**

1. A method for preparing 2-substituted-4(R)-hydroxy-2-cyclopenten-1-one which comprises:

preparing 2-substituted-4(R)-hydroxy-cyclopentane-1,3-dione by a method selected from the group consisting of

a. catalytically hydrogenating a compound of the formula



where

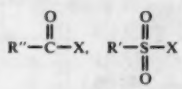
R is selected from the group consisting of a hydrocarbon radical containing from about 1 to 4 carbon atoms and benzyl and

n is an integer from about 1 to 12, the hydrocarbon chain represented by $(CH_2)_n$ being saturated or containing a cis double bond or triple bond at the 5–6 position in the equivalent acid side chain represented by $(CH_2)_nCOOH$ in the presence of a rhodium complex with a catalyst comprising a chiral phosphine ligand;

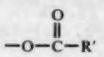
b. subjecting 2-substituted cyclopentane-1,3,4-trione or 2-substituted-3-alkoxy-2-cyclopentane-1,4-dione to the fermentative enzymatic action of a microorganism of the class Ascomycetes; and

c. resolving 2-(6′-carbomethoxyhexyl)-4-hydroxycyclopentane-1,3-dione with brucine

and recovering the corresponding 2-substituted-4-(R)-hydroxy-cyclopentane-1,3-dione enolizing the said dione by reacting it under basic conditions with compounds selected from the group consisting of



where X is selected from the group consisting of I, Cl, Br,



and $—OSO_2R'$ and

R′ is selected from the group consisting of pivaloyl, isobutyl, phenyl, benzyl, bipenyl, naphthyl, alkanyl and alkenyl having from about 1 to 6 carbon atoms, and halogen-, *alkyl- and alkoxy-substituted phenyl, benzyl,* biphenyl and naphthyl groups,

and R″X

where R″ is selected from the group consisting of saturated and unsaturated alkyl having from about 1 to 6 carbon atoms, benzyl, diphenylmethyl, CH_2COOR''' and R‴—CH—COOR‴ where R‴ is a hydrocarbon radical containing from about 1 to 6 carbon atoms, and

X is selected from the group consisting of Cl, Br, I, sulfate, isocyanate, aryl sulfonate and alkyl-substituted aryl sulfonate radicals

to preferentially promote acylation or alkylation of the oxygen atom at the C-1 position of the dione

recovering the substituted C-1 enol

reducing the said substituted C-1 enol with a hydride reducing agent and recovering 2-substituted-4(R)-hydroxy-2-cyclopenten-1-one from the reduction reaction mixture.

Re. 29,991

ADAPTABLE TIME DIVISION SWITCH

John R. Wolcott, Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Original No. 3,971,891, dated Jul. 27, 1976, Ser. No. 558,605, Mar. 14, 1975. Application for reissue Nov. 21, 1977, Ser. No. 853,069

Int. Cl.[2] **H03K** *13/22;* **H04J** *3/00;* **H04L** *3/00;* **G06F** *5/00*

U.S. Cl. 179—15 AP **36 Claims**

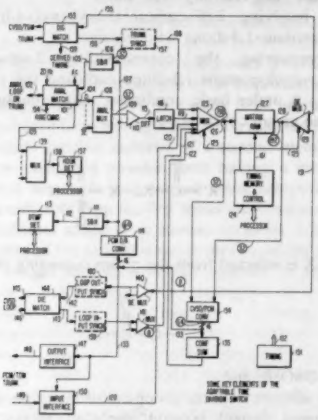
35. A telephone switching network providing time division switching between multiple time division multiplexed signals comprising:

a. multiplexing means having a multiplicity of input ports, and adapted to receive a mutliplicty of CVSD/TDM inputs, with different numbers of TDM channels at each input port, and provide a CVSD/TDM output as determined by a first memory means, said output representing signals before switching,

b. switching means connected to receive said CVSD/TDM signals from said multiplexing means and selectively rearrange the data in the channels of said CVSD/TDM signals under control of a second memory means, the output therefrom representing said signals after switching, and

c. demultiplexing means for connecting selected ones of the channels in the output of said switching means to selected

output ports thereof under control of said first memory means, and providing either half duplex or full duplex inter-



connections between inputs of said multiplexing means, and outputs of said demultiplexing means.

Re. 29,992

INTEGRATING ANALOG-TO-DIGITAL CONVERTER HAVING DIGITALLY-DERIVED OFFSET ERROR COMPENSATION AND BIPOLAR OPERATION WITHOUT ZERO DISCONTINUITY

Ivar Wold, Medfield, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Original No. 3,872,466, dated Mar. 18, 1975, Ser. No. 380,690, Jul. 19, 1973. Application for reissue Mar. 15, 1977, Ser. No. 777,690

Int. Cl.[2] **H03K** *13/20*

U.S. Cl. 340—347 NT **43 Claims**

1. An analog-to-digital converter comprising:

an integrator arranged to produce ramp signals at rates corresponding to the magnitude of signals applied to the input thereof, the ramp direction being determined by the polarity of the applied signal;

means to condition said integrator to start integrating from a predetermined output datum level at a start time;

means to supply reference signals of opposite effective polarity for application to the input of said integrator;

clock means for producing clock pulses and successive timing control pulses following said start time;

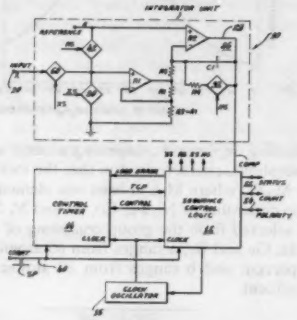
switch means for applying signals to the input of said integrator;

first means to operate said switch means at said start time to apply to said integrator one of said reference signals in a given polarity to cause said integrator to ramp away from said datum level for a first time period as measured by said clock means;

second means to operate said switch means subsequent to said first time period to apply to the input of the integrator one of said reference signals of polarity opposite to said given polarity to cause said integrator to ramp back towards said datum level during a second time period;

a comparator coupled to the output of said integrator for producing a compare signal when said integrator output returns to said datum level, thereby signalling the end of said second time period;

third means responsive to the development of said compare signal at the end of said second time period for activating said switch means to apply to said integrator input for a



third time period a composite signal including one of said reference signals and the unknown analog signal which is to be converted to a digital signal, said third time period being terminated upon the occurrence of a first one of said timing control pulses;

means operable at the termination of said third time period for applying to the input of said integrator one of said reference signals of polarity opposite to that of said composite signal, thereby to ramp said integrator output back towards said datum level during a fourth time period; and

digitizing means coupled to the output of said comparator and to said clock means for producing an output digital signal representing the number of clock pulses occurring between the appearance of a second one of said timing control pulses and the development by said comparator of a compare signal signalling the end of said fourth time period.

PATENTS

GRANTED MAY 8, 1979

ERRATA

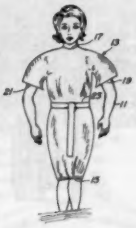
For CLASS	See PATENT NO.
182–155	4,152,834
414–133	4,153,165
414–695	4,153,166
414–694	4,153,167
414–786	4,153,168
414–442	4,153,169
406–028	4,153,304
308–009	4,153,315
418–102	4,153,400
546–007	4,153,601
546–037	4,153,602
546–142	4,153,603
546–022	4,153,604
546–264	4,153,605
423–531	4,153,628
568–574	4,153,635
568–684	4,153,636
585–405	4,153,637
585–526	4,153,638
427–107	4,153,750
521–155	4,153,768
318–341	4,153,853
340–711	4,153,940

PATENTS

GRANTED MAY 8, 1979

GENERAL AND MECHANICAL

4,152,782
DISPOSABLE GARMENT FOR WEAR BY A PERSON BEING IMMERSED IN A LIQUID
Frank Kincaid, Decatur, Ill., assignor to Collegiate Cap and Gown Company, Champaign, Ill.
Filed Oct. 25, 1974, Ser. No. 518,065
Int. Cl.[2] A41D *1/22*
U.S. Cl. 2—74 **2 Claims**



1. A disposable gown for wear by a person being baptized by immersion comprising:

a front panel of a lightweight, non-absorbent, non-woven fabric cut to form a generalized shape of the outline of a human body from the knees to the neck with a scooped line at the neck and wide abbreviated arms, said front panel having one side colored white for external appearance and the other side having a dark color to provide opacity;

a back panel substantially identical to said front panel, said panels positioned to have the dark colored sides facing one another and being stitched together along the peripheries thereof to form a garment having a bottom opening for the legs of the wearer, a top opening for the head and neck of the wearer, and armholes for the arms of the wearer;

a band of elastic material stitched to the inner sides of said panels around said bottom opening to pinch the gown about the legs of the wearer to prevent it from rising as the wearer is immersed;

a vertical slot formed in said back panel downwardly from said top opening to permit air entrapped in the gown as the wearer is immersed to be vented without unduly expanding the gown;

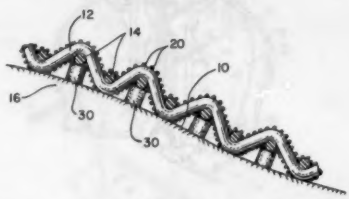
a snap closure device located at the top of said vertical slot; and

a belt element stitched to each side of said front panel for fastening only at the front of the gown in order not to interfere with the passage of entrapped air to said slot.

4,152,783
LUBRICANT FOR SURGEON'S GLOVES AND METHOD OF APPLYING SAME
Pradip V. Choksi, Northridge, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Oct. 19, 1977, Ser. No. 843,401
Int. Cl.[2] A41D *19/00*; A61B *19/00*
U.S. Cl. 2—168 **5 Claims**

1. A surgeon's glove having a surface adapted to fit against the surgeon's hand, which surface is coated with a water-soluble tissue innocuous powder that has a particle size in the range of 2 to 30 micron.

4,152,784
NYLON HOSE TREATED WITH MICROENCAPSULATED HAIR DISSOLVING SOLUTION
James D. McGalliard, 11171 Fenwick Pl., Santa Ana, Calif. 92705
Filed Feb. 1, 1978, Ser. No. 873,814
Int. Cl.[2] A41B *11/00*
U.S. Cl. 2—239 **17 Claims**



1. A garment wearable by a person to automatically remove unwanted hair, comprising:

fabric coated with plural microcapsules;

a liquid depilatory agent contained within said plural microcapsules; and

said microcapsules comprising a pressure-sensitive thin shell which releases said depilatory agent in response to pressure exerted by a hair stubble, said depilatory reducing the disulfur cross-links of said hair stubble upon contact therewith.

13. A device for automatically removing body hair comprising:

a flexible material having a depilatory agent contained thereon; and

means responsive to the presence of a hair stubble extending above said body for automatically dispensing said depilatory agent in a localized area at said hair stubble when said flexible material is held against said body of a user to remove said hair stubble while limiting the application of said agent to said body itself.

15. The process of removing body hair comprising:

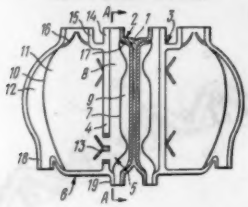
depositing a depilatory agent on a flexible material to be held against the skin of a user; and

automatically releasing said depilatory agent from said flexible material in a localized area at a hair stubble in response to the presence of said hair stubble extending beyond said skin.

4,152,785
ARTIFICIAL HEART
Valery I. Shumakov, ulitsa Smolenskaya, 7, kv. 56, and Moisei A. Lokshin, ulitsa 8 Marta, 7/5, kv. 12, both of Moscow, U.S.S.R.
Filed Jan. 3, 1978, Ser. No. 866,813
Int. Cl.[2] A61F *1/24*; A61M *1/03*
U.S. Cl. 3—1.7 **4 Claims**

1. An artificial heart comprising: a rigid housing whose dimensions and shape are close to those of the natural heart; a rigid solid central partition dividing said housing into two halves corresponding to the left heart and right heart, respectively; a rigid lateral partition in each of said halves, which divides the respective half into two chambers one of which adjoins said central partition and is an auricle chamber, whereas the other is interposed between said auricle chamber and the wall of said housing and is a ventricle chamber; a flexible diaphragm arranged in each of said auricle chambers and dividing the respective auricle chamber into two cavities

one of which adjoins said central partition and is intended for a working medium, whereas the other adjoins said lateral partition and is intended for blood; a flexible diaphragm arranged in each of said ventricle chambers and dividing the respective ventricle chamber into two cavities one of which adjoins said lateral partition and is intended for blood, whereas the other adjoins the wall of said housing and is intended for the working medium; check valves installed in each of said lateral partitions, which check valves serve to communicate said blood cavities of said auricle and ventricle chambers and



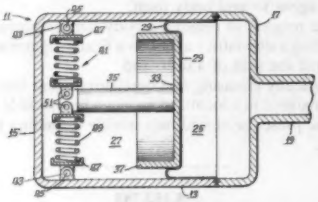
transfer blood from the auricle chamber to the ventricle chamber; an inlet pipe of said blood cavity of each of said auricle chambers, intended to communicate the respective auricle chamber with the venous bed of the patient; an outlet pipe of said blood cavity of each of said ventricle chambers, intended to communicate the respective ventricle chamber with the arterial bed of the patient; a check valve in each of said outlet pipes of each of said ventricle chambers; a pipe of the working medium cavity of each of said auricle chambers, intended to communicate the respective auricle chamber with a working medium source.

4,152,786

COMPENSATOR FOR IMPLANTED BLOOD PUMP

Kenneth D. Clark, Pleasant Hill; Jal S. Jassawalla, San Francisco, and Peer M. Portner, Berkeley, all of Calif., assignors to Andros Incorporated, Berkeley, Calif.

Filed Dec. 12, 1977, Ser. No. 859,916
Int. Cl.[2] A61F *1/24*; A61M *1/03*
U.S. Cl. 3—1.7 **8 Claims**



1. A compensator designed for implantation within a living body in connection with an implanted reciprocating blood circulation device which compensator comprises

a housing which defines a gas-tight chamber,

a flexible membrane mounted in said housing which divides said chamber into a front portion and a gas-tight rear portion, said membrane being designed to permit movement to change the volume of said rear chamber portion,

means for connecting said front portion in fluid communication with the reciprocating circulation device,

compression spring means mounted in said rear portion, and

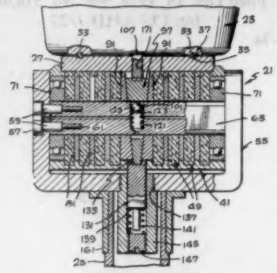
means linking said spring means to said flexible membrane so that said compression spring means exerts a force against said membrane during the pumping stroke of said blood circulation device, which force assists in the movement of said membrane in a direction which causes the volume of said rear chamber portion to expand.

4,152,787

PROSTHETIC KNEE JOINT HAVING WEIGHT RESPONSIVE BRAKE

Joseph Meggyesy, 8103 Crenshaw Blvd., Inglewood, Calif. 90305

Filed Jul. 11, 1977, Ser. No. 814,295
Int. Cl.[2] A61F *1/08*; F16D *55/24*
U.S. Cl. 3—27 **3 Claims**



1. A knee prosthesis comprising

a femoral element including

means for retaining an above-the-knee amputation stump,

actuating means fixed to and extending from said retaining means, and

a housing means mounted on said femoral element for reciprocatable movement between predetermined limits relative thereto, said housing means including

slot means extending about a portion of the periphery of said housing and through which said actuating means extends and

rotation prevention means in the interior surface of said housing;

a tibial element including

shaft means pivotally supported in said housing for relative rotation therebetween about the axis of said shaft means and having

rotation prevention means on the exterior surface of said shaft means and

lower leg means fixedly attached to said shaft means; and

brake means for selectively preventing relative rotation between said housing and said shaft means comprising

a plurality of first friction disc means mounted on said shaft means near the ends thereof for rotational and axial movement relative thereto and operatively engaged with said housing rotation prevention means,

a plurality of second friction disc means mounted on said shaft means near the ends thereof for axial movement relative thereto and for rotational movement relative to said housing and operatively engaged with said shaft means rotation prevention means, said first and second disc means alternately arranged along the axis of said shaft means, and

means for actuating said first and second discs into frictional facial engagement comprising

a pair of reaction discs mounted on said shaft near the central portion of the length thereof, each reaction disc having

a first surface generally parallel and adjacent to a facial surface of an adjacent one of said first and second discs and

a second, cam surface oriented in a plane intersecting the facial plane of said first reaction disc surface, said reaction discs each located on said shaft means for axial movement relative thereto and operatively engaged with said shaft means rotation prevention means, and

an actuation disc mounted on said shaft means in operative engagement with said shaft means rotation pre-

vention means and abaxially movable relative to said shaft means, said actuation disc being located intermediate said reaction discs and adjacent the cam surfaces thereof and having

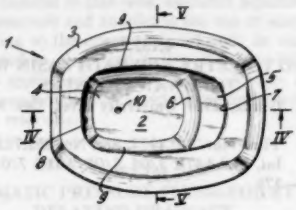
cam surface means on the opposite surfaces thereof formed at complementary angles relative to said reaction disc cam surfaces, said actuation disc being located so as to be aligned with said slot means and the outer periphery thereof in contact with said actuating means.

4,152,788

PORTABLE BIDET

Antonio Z. F. R. P. Gomes, 107 Bergen St., Harrison, N.J. 07029

Filed Oct. 28, 1977, Ser. No. 846,398
Int. Cl.[2] A47K *3/22, 11/08*
U.S. Cl. 4—6 **12 Claims**



1. A portable bidet for use on a toilet comprising a basin shaped to fit within the bowl of the toilet and having a peripheral edge, said peripheral edge consisting of a forward edge, a rearward edge and a pair of oppositely spaced side edges extending between said forward and rearward edges with said forward edge arranged to be positioned adjacent the front edge of the toilet bowl and the rearward edge arranged to be positioned adjacent the rear edge of the toilet bowl, a rim member secured to the peripheral edge of said basin and extending laterally outwardly from said edge, said rim member having an upwardly facing surface and a downwardly facing surface with said downwardly facing surface arranged to be supported on the upper surface of the toilet surrounding its bowl and said upwardly facing surface of said rim forming a seating surface on the bidet, said basin depending downwardly from the downwardly facing surface of said rim so that the basin extends downwardly into the toilet bowl, said basin having an outlet opening therein with the remainder of said basin being imperforate, said basin having an upwardly facing surface comprising a generally horizontally extending first surface spaced downwardly from said upwardly facing surface of said rim member and located adjacent the forward edge of said basin, a general horizontally extending second surface spaced downwardly from said first surface and spaced between said first surface and the rearward edge of said basin, an upwardly extending third surface joined at its lower edge to said second surface and at its upper edge to said first surface and being disposed obliquely to said first and second surfaces with said third surface sloping downwardly rearwardly from said first surface to said second surface.

4,152,789

SHOWER STALL ENCLOSURE

Frederick G. Heath, Louisville, Ky., assignor to VBM Corporation, Louisville, Ky.

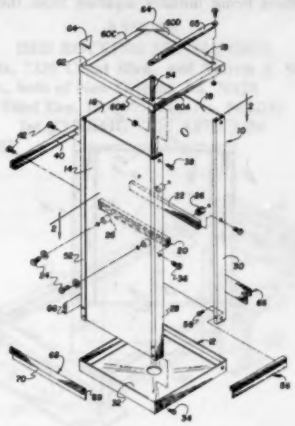
Filed Nov. 25, 1977, Ser. No. 854,804
Int. Cl.[2] A47K *3/22*
U.S. Cl. 4—146 **14 Claims**

1. A shower stall comprising:

wall panels joined together to form a three-sided enclosure defining a rear wall, a pair of opposing side walls, a frontal access opening and two right angular rear corners,

a pair of rigid elongated hand rail members separate and distinct from one another attached to and extending at least partially along opposing broad surfaces of said side walls within said enclosure, the rear ends of said members extending to and terminating against opposite side portions of said real wall,

means for spacing said members from said opposing broad



surfaces to permit hand gripping of said members by a person standing within said enclosure, and

an elongated brace attached to and extending at least partially across the back of said rear wall outside of said enclosure between the rear ends of said members, opposite end portions of said brace being connected through opposite side portions of said rear wall to different ones of said members, whereby said separate and distinct hand rail members within said enclosure and said brace external to said enclosure interconnect and rigidify said wall panels.

4,152,790

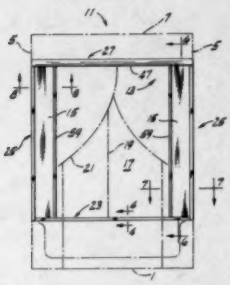
SHOWER ENCLOSURE

Nicholas J. Obradovits, St. Louis, Mo., assignor to Shower Enclosure Service Company, St. Louis, Mo.

Filed Feb. 1, 1978, Ser. No. 874,331
Int. Cl.[2] A47K *3/14*
U.S. Cl. 4—149 **10 Claims**

1. A shower enclosure for confining shower spray to a shower area defined in part by a bathtub or the like and walls at opposite ends of the bathtub, said enclosure being adapted to be installed between said end walls above one side of the bathtub and comprising a pair of long, relatively narrow panels, a rectangular frame having a bottom frame member adapted to rest atop the bathtub along said one side thereof, side frame members adapted to be seallingly secured in watertight fashion to said end walls, and a top frame member, said frame members having slots therein extending the entire length thereof for forming a continuous slot around the inside periphery of the frame to hold said panels vertically in the frame at opposite sides thereof with the bottom edge, one side edge and the top edge of each panel being received in respective slots in the frame members, said panels being sufficiently narrow with respect to the width of the frame for providing a relatively large opening between said panels to allow ready access to the shower area, and a spacer adapted to extend between the panels in a slot in one of the bottom and top frame members for holding the panels in position in the frame at opposite sides thereof, said top frame member having a portion extending inwardly from the frame, said portion having a track spaced inwardly from the frame for slidably holding a plurality of

hooks or the like for suspending a shower curtain on the inside of the frame with the curtain hanging down inside the bathtub, said hooks or the like being slidable along the track for sliding the shower curtain between a first position in which the opening between the panels is open to permit access to the shower area, and a closed position in which the opening between the panels is closed to prevent escape of shower spray from the shower area through the opening, said enclosure preventing the escape of shower spray from the shower area at the sides of the curtain toward the ends of the bathtub, said top and bottom frame members being initially separate from the side frame



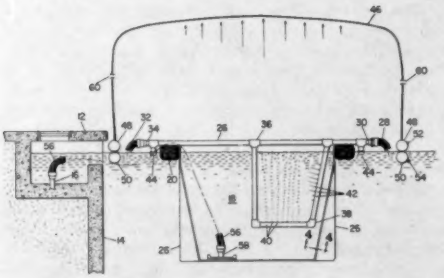
members and being adapted to be cut to a length corresponding to that of the bathtub and then assembled with the side frame members, each of the latter comprising a web and flanges at opposite sides of the web adapted to engage a respective end wall with the web spaced from and generally parallel to the wall for reception of caulking or the like between the side flanges to provide a watertight seal between the side frame member and said end wall, and the ends of each of said bottom and top frame members being formed to interfit with the flanges of the side frame members for securing the bottom and top frame members to the side frame members.

4,152,791

FLUID CONTROL ARRANGEMENTS, APPLICABLE TO SPA FACILITIES

Alan C. Rose, 5030 Calvin Ave., Tarzana, Calif. 91356

Filed Oct. 6, 1975, Ser. No. 620,148
Int. Cl.[2] E04H *3/16*
U.S. Cl. 4—172 **9 Claims**



1. In a spa-type arrangement for use with an existing pool having a pump, filter, and heater:

a small inexpensive pliable container large enough to hold at least one person;

means for supporting said pliable container so that it will retain its normal fully extended shape when filled with water;

flexible hose means for supplying said container with hot water from the pool heater;

means connected to the end of said flexible hose away from said heater for directing a stream of hot water direct from said heater into the water within said container and below the surface of the water within said container;

additional flexible hose means for recirculating water from said pliable container directly to the swimming pool recirculation inlet; whereby said pool heater is capable of rapidly heating the water in said container to spa level temperatures; and

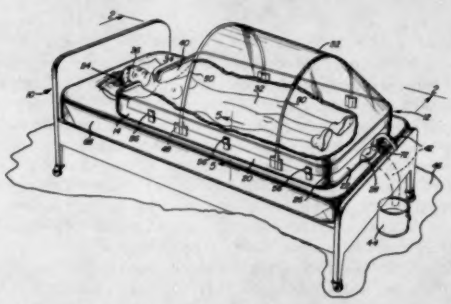
said arrangements further including means for providing heat insulation for the water within said container.

4,152,792

BED TOILETRY AND BATH BASIN WITH THROWAWAY LINERS

Georgia E. Glintz, 2909 University Ave., Des Moines, Iowa 50311

Filed Nov. 18, 1977, Ser. No. 852,713
Int. Cl.[2] A47K *3/06, 3/08;* **A61G** *7/04*
U.S. Cl. 4—175 **5 Claims**



1. A receptacle for containing a person to have a bed bath and for performing toilet functions, said receptacle including a form retentive, but foldable, body constructed of water impervious material and defining a bottom wall extending between and from whose outer margin peripherally continuous, integral and upwardly extending opposite side and end walls project, one of said peripheral walls having an opening formed through a lower portion thereof, and a flexible and upwardly opening liner constructed of water impervious material removably seated in and conforming, substantially, to the interior shape of said receptacle, the marginal portion of said liner corresponding to said one peripheral wall including an elongated flexible drain outlet neck projectable through said opening, a plurality of downwardly concave arched support bows removably supported from and spanning said receptacle between opposite side walls thereof with said bows generally paralleling each other and spaced along the length of said receptacle between said one wall and the wall opposite said one wall, and a flexible non-transparent drape removably disposed over and supported from said bows, said drape including marginal portions overlapping the exteriors of one of said end walls and said opposite side walls, said drape marginal portions include skirt portions projecting downwardly from the inner surfaces thereof spaced above the corresponding marginal edges of said drape and lapped over the inner surface of said one end wall and said opposite side walls.

4,152,793

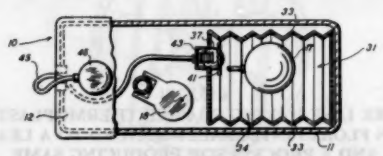
FLUSH TANK WATER SAVER

Daniel J. Mills, 1657 Via Alegre, San Dimas, Calif. 91773

Continuation-in-part of Ser. No. 719,373, Sep. 23, 1976, abandoned. This application Jun. 15, 1977, Ser. No. 807,732

Int. Cl.[2] **F03D** *1/00, 5/094*

U.S. Cl. 4—325 **8 Claims**



1. Liquid control appartus for a liquid flush tank having a controlled inlet for liquid under pressure responsive to tank liquid level and a manually controlled outlet to an open bowl and comprising a plurality of contiguous walls defining a liquid reservoir containable in said tank, an outlet adjacent the bottom of said reservoir and an inlet at the top of said reservoir both connecting to the interior of said tank; an outlet valve element adapted to close said outlet, and fluid-filled means responsive to applied pressure adapted to displace said valve element from said outlet for liquid interchange between said tank and said reservoir.

4,152,794

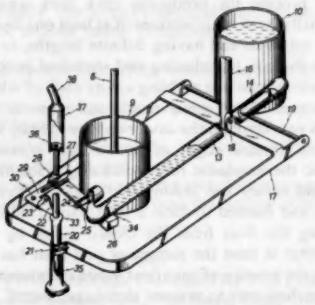
AUTOMATIC PRESSURE FLUSH-TOILET OF DELAYING DRAINAGE

Tien H. Pan, 5th Fl., No. 175-9, Kuo Ching, Taipei Hsien, Taiwan

Filed Nov. 22, 1976, Ser. No. 744,139

Int. Cl.[2] **E03D** *11/00, 13/00, 1/06*

U.S. Cl. 4—432 **4 Claims**



1. An automatic flushing system for a toilet bowl having a liquid inlet, a liquid outlet and a liquid reservoir for supplying flushing liquid to the bowl through said inlet, said system comprising a toilet seat atop said bowl, resilient compression means interposed between said seat and said bowl, a first viscous-liquid cylinder, a plunger in said first cylinder, a rod connecting said plunger to said seat whereby pressure applied to said seat to compress said resilient compression means also effects depression of said plunger in said first cylinder and release of said applied pressure on said seat causes the resilient compression means to expand thereby raising said seat and also raising said plunger in said first cylinder, a second viscous-liquid cylinder, a liquid flow pipe connecting said first and second cylinders, said pipe being inclined upwardly from said first cylinder to said second cylinder, a free-floating magnet within said pipe, said magnet having limited free travel within said pipe between lower and upper positions, said magnet being urged towards said upper position by liquid flowing from said first to said second cylinder in response to said application of pressure on said seat, said magnet being urged to said lower position by liquid flowing from said second to said first cylinder in response to the release of said pressure from said seat, control means for releasing flushing liquid from said reservoir to flow into said bowl, magnetic triggering means for actuating said control means in response to said magnet attaining said lower position in said pipe and mechanical cocking means operative in response to said pressure applied to the seat for setting said triggering means to respond to said magnet when said magnet attains said lower position.

4,152,795

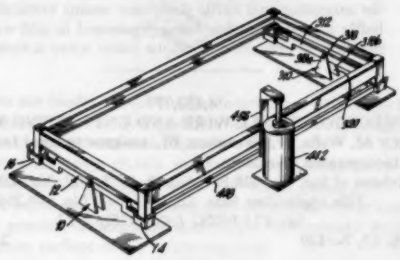
BED ROCKING MECHANISM

John Rodosta, 7339 Canal Blvd., and Morris J. Weisler, 358 Sharon Dr., both of New Orleans, La. 70124

Filed Dec. 19, 1977, Ser. No. 862,022

Int. Cl.[2] **A61G** *7/06;* **A47D** *9/04*

U.S. Cl. 5—62 **10 Claims**



1. Portable apparatus for imparting a rocking motion to a bed which includes a frame with first and second substantially opposed ends and legs attached to and extending downwardly from said frame at each of said opposed ends, including:

first and second base members disposable respectively adjacent to said first and second substantially opposed ends of said bed;

first and second elongated support members pivotably mounted on said respective base members, each of said elongated support members having first and second opposed bifurcated ends, each of said bifurcated ends defining a recess adapted to receive one of said legs of said bed so that each of said ends of said bed is supported by one of said elongated member;

means to periodically raise and lower at least one end of at least one of said elongated support members to impart a periodic rocking motion to said bed;

first and second normally closed switchable valves;

first and second activating members attached to said elongated member such that said first and second activating members respectively contact and activate said first and second switchable valves when said elongated member is at first and second predetermined positions; and

means responsive to the activation of either of said switchable valves to reverse the direction of motion of said elongated support member.

4,152,796

WATERBED MATTRESS

Isaac Fogel, Silver Spring, Md., assignor to Classic Products Corporation, Beltsville, Md.

Filed Mar. 28, 1978, Ser. No. 890,993

Int. Cl.[2] **A47C** *27/08*

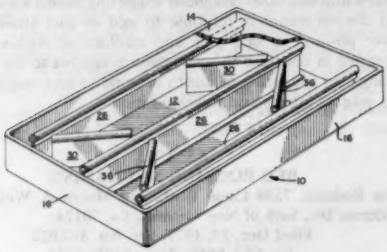
U.S. Cl. 5—451 **11 Claims**

1. A waterbed mattress having baffle dampener means for substantially eliminating water wave action comprising:

a top sheet, a bottom sheet, and peripheral vertical walls where said top sheet and said bottom sheet are joined to

said perpherial vertical walls on their peripheral edges to form a sealed envelope; and

a plurality baffle dampener means in said waterbed mattress, said baffle dampener means being affixed to the interior



surface of the bottom sheet and having floatation means for extending said baffle dampener means vertically, said baffle dampener means being positioned in said waterbed mattress to prevent continuous water wave action.

4,152,797

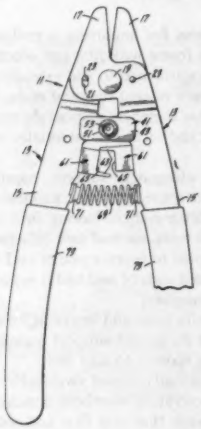
PRECISION SMALL WIRE AND UNTWISTING TOOL

Peter M. Wells, Jr., Sycamore, Ill., assignor to Ideal Industries Incorporated, Sycamore, Ill.

Division of Ser. No. 610,537, Sep. 5, 1975, Pat. No. 4,047,297. This application Mar. 22, 1976, Ser. No. 669,294

Int. Cl.[2] H02G *1/00*; B25B *7/22*

U.S. Cl. 7—129 **2 Claims**



1. A tool for use with fine gauge insulated wire formed in twisted pairs, said tool including a pair of elongated members pivotally connected to each other, handles on one side of the pivot to provide manual manipulation for the tool, cutting blades on the elongated members, and a wire untwisting device on the members including a plastic pad mounted on each elongated member on the inner surface thereof in facing relation to each other so upon pivotal movement of the elongated member the pads move toward and away from each other, an opposed surfaces on each of the pads which close upon manipulation of the elongated members to form a guideway which engages the wires and causes them to untwist when the wire is being pulled therethrough and the handles are held with the opposed surfaces closely adjacent to each other defining the guideway, and a first projecting means on one of the pads which, when the elongated members are in their open position, is spaced from the other pad to provide an opening so that the twisted wires may be inserted, and a second projecting means on one of the pads spaced from said first projecting means longitudinally therefrom and being substantially in the same plane of the pads, said first and second projecting means each extending from their respective pad to overlap the other pad so as to close the guideway at each end when the handles are manipulated to the closed position.

4,152,798

CORK LINE HAVING FOAMED THERMOPLASTIC RESIN FLOATS INTEGRALLY BONDED TO A LEADER AND A PROCESS FOR PRODUCING SAME

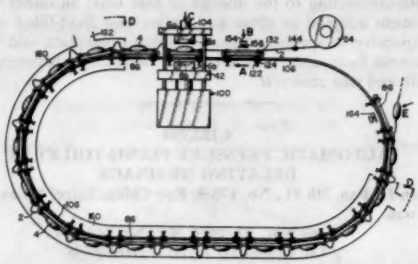
Seshiro Akaura; Yasushi Nagamune, and Takeshi Nakamura, all of Settsu, Japan, assignors to (Ashimoro Industry, Co., Ltd.) Ashimori Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 27, 1977, Ser. No. 791,649

Claims priority, application Japan, Apr. 27, 1976, 51-48739

Int. Cl.[2] B29D *27/00*; B63B *21/52*

U.S. Cl. 9—8 R **19 Claims**



1. A process for producing cork lines which comprises sequentially stretching portions of at least one flexible leader at definite intervals and having definite lengths, to prevent contraction thereof, introducing said stretched portions intermittently into at least one molding cavity each of which is defined by a pair of closed metal molds and wherein the stretched portions pass through the cavity and are held by furrows at the junctional surface edges of said molds, injecting a molten synthetic thermoplastic resin containing a foaming agent into said mold cavity and around said leader where said resin is molded and foamed to form a float fixed around said leader, removing the float from the closed molds by opening said molds after at least the surface of said float has been cooled, cooling the interior of said float while maintaining said leader in a stretched state to prevent shrinkage thereof, and releasing said leader from the stretched state.

4,152,799

SLIDE SWING BEARING

Waldemar Koster, Forsbach, and Reinhold Huber, Rorbas, both of Switzerland, assignors to Kober AG, Switzerland

Filed Jun. 22, 1978, Ser. No. 918,088

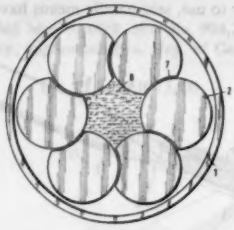
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728549

Int. Cl.[2] E01D *19/06*

U.S. Cl. 14—16.1 **20 Claims**

1. A sliding swing bearing comprising upper and lower supporting members, one of which is movable relatively to the other and a slide member interposed there between in sliding contact with the movable supporting member, said slide mem-

ber comprising at least one series of slide elements formed with cooperable contact edges and arranged in an endless interen-



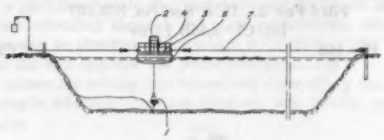
gaging chain, forming a central pocket and having a lubricant located therein.

4,152,800

SLUDGE SUCTION UNIT FOR SETTLING BASINS

Nils O. Nilsmar, Stockholm, Sweden, assignor to Maskin AB N.A. Eie, Bandhagen, Sweden

Filed Nov. 11, 1977, Ser. No. 850,682
Claims priority, application Sweden, Nov. 18, 1976, 76129261
Int. Cl.[2] C02C *1/36*
U.S. Cl. 15—1.7 **6 Claims**



1. A continually operating, completely automatic sludge suction unit for settling basins, comprising
   (a) a float,
   (b) an independent sludge pump which is separate from said float,
   (c) means for automatically propelling said float on the surface of liquid in the basin,
   (d) cable means for suspending said independent sludge pump from said float, and
   (e) spoil line means for connecting said sludge pump to the float for withdrawing sludge from the bottom of the basin.

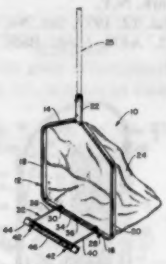
4,152,801

SWIMMING POOL DEBRIS COLLECTION APPARATUS

Victor Lieber, 6558 Lasaine Ave., Van Nuys, Calif. 91406

Filed Jan. 6, 1978, Ser. No. 867,220
Int. Cl.[2] E04H *3/20*; B01D *33/34*
U.S. Cl. 15—1.7 **4 Claims**

1. A swimming pool debris collection apparatus comprising:
   an enclosed frame having an enlarged center opening, said frame having a front side and a rear side;
   an elongated handle attached to said frame;
   a debris collecting means attached to said rear side of said frame along the entire length of said frame, the wall structure of said debris collecting means permitting passage of water therethrough but retains solid material of a certain size or greater;
   a debris disturber connected by attaching means to said front side of said frame, said debris disturber including an elongated member located spaced from said front side of said frame opposite said debris collecting means, said elongated member to be in physical contact with the bottom surface of the swimming pool as the frame is moved therealong which results in debris located against the bottom surface becoming dislodged and temporarily suspended in the water a short distance above the bottom surface to facilitate entry into the enlarged opening and collection by said debris collecting means;
   said attaching means comprising a bracket, said bracket comprising a narrow member interconnecting said elongated member and said frame in such a manner so as to produce a substantial amount of open area between said elongated member and said frame, whereby said bracket



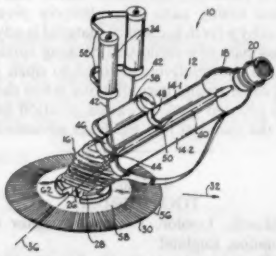
does not hinder or prevent the disturbing of debris and the suspending of the debris within the water after passage of said elongated member thereover; and
   said bracket being pivotly mounted to said frame so as to permit said debris disturber to be located against the bottom surface of the swimming pool regardless of the angular position assumed by said frame with respect to the bottom surface of the swimming pool.

4,152,802

APPARATUS FOR CLEANING SUBMERGED SURFACES

Daniel J. V. D. Chauvier, 8 Hertzog Rd., Sharon Park, Dunnottar, South Africa, assignor to D. J. V. D. Chauvier, Selcourt Transvaal, South Africa

Filed Feb. 21, 1978, Ser. No. 879,241
Claims priority, application South Africa, Nov. 4, 1976, 76/6618
Int. Cl.[2] E04H *3/20*
U.S. Cl. 15—1.7 **4 Claims**



1. An apparatus for cleaning a surface submerged in a liquid, said apparatus including
   a body adapted to move across said surface, said body being structured to clean said surface while moving across said surface,
   a main buoyancy member displaceably attached to said body so as to be automatically displaceable relative to said body by the buoyant forces which it experiences in use in accordance with the attitude assumed by said body in said liquid, said main buoyancy member being pivotally attached to said body to be pivotable about a pivot axis, and said pivot axis being tiltable about a tilt axis relative to said body, and
   tilting means for automatically varying the orientation of

said pivot axis relative to said body in accordance with the attitude assumed by said body in said liquid.

4,152,803

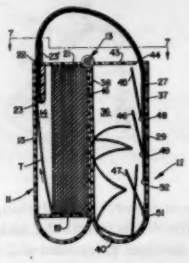
AUTOMATIC DISPENSER-APPLICATOR

Robert P. Gersin, New York, N.Y.; Charles S. Totaro, Boonton, N.J.; Roland Gebhardt, New York, N.Y., and Modest Khovaylo, Old Bridge, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 12, 1977, Ser. No. 815,021

Int. Cl.[2] A47L *13/46*; B05C *17/00*

U.S. Cl. 15—104.94 **7 Claims**



1. An applicator device having an automatically renewable applicator surface comprising two casing parts pivotally connected for movment between a closed position and an open position wherein a surface impregnated with or otherwise bearing a treatment substance is exposed, one of said casing parts providing a supply chamber for storing a length of flexible tape or tape-like material bearing said substance and the other of said casing parts providing a chamber for receiving and accummulating said material after use, means for automatically feeding a fresh section of said material out of said first casing part to be exposed for use when the casing parts are relatively pivoted to open position comprising means extending between said casing parts automatically shaped for forming an arcuate backing surface for said exposed material when the casing parts are relatively pivoted to said open position, and comprising means whereby material at the leading end of said fresh section is positively advanced within said other casing part when said casing parts are relatively pivoted to open position, whereby a fresh section of material is advanced out of said one casing part of overlie said backing surface each time the casing parts are relatively pivoted to open position, and means in said other casing part effective when the casing parts are relatively pivoted back to closed position for preventing retraction of the material that has been advanced thereinto.

4,152,804

TOOTHBRUSH

Melvyn D. Morris, London, England, assignor to Addygable Limited, London, England

Filed May 31, 1977, Ser. No. 801,584

Claims priority, application United Kingdom, Jun. 11, 1976, 24388/76

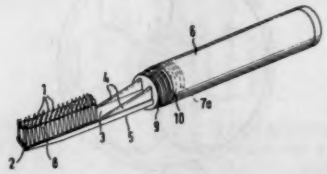
Int. Cl.[2] A46B *17/02*

U.S. Cl. 15—167 R **7 Claims**

1. A disposable toothbrush device, comprising:

a brushing member including (i) a brushing head having flexible bristles therein, (ii) a shaft carrying the brushing head at one end thereof, (iii) an attachment means affixed to the remaining end of said shaft remote from said brushing head, and (iv) a plurality of ribs provided on said shaft adjacent the brushing head for reinforcement of said shaft to render said shaft relatively rigid with respect to said bristles, said ribs being tapered and having a maximum width at the end of said shaft remote from said brushing head and tapering to a minimum width of essentially zero adjacent the head, said brushing head, bristles, shaft, ribs and attachment means of said member being formed from a plastic material as a unitary plastic molding; and

a hollow handle means in which said brushing member is housed prior to use, said handle means having one closed



end, and an openable end from which said brushing member is removable from its housed position to a second brushing position wherein said attachment means on said shaft is secured onto said handle in a reverse manner from that of its housed position.

4,152,805

BROOM COVER

Nydia Saldarriaga, 48-15 59th St., Woodside, N.Y. 11377, and Gregorio Aragon, 40-13 80th St., Elmhurst, N.Y. 11373

Filed Feb. 21, 1978, Ser. No. 879,207

Int. Cl.[2] A46B *17/04*

U.S. Cl. 15—168 **1 Claim**

1. A broom cover for a broom having a broomstick with a bundle of fibers affixed to one end thereof, said broom cover comprising

a sleeve-like case for covering part of the bundle of fibers of a broom next-adjacent the handle of the broom, said case having a pair of spaced opposite substantially parallel face panels of pliable fabric material lined with foam rubber joined to each other by a pair of spaced opposite substantially parallel side panels substantially perpendicular to said face panels, the material of said side panels being different from that of said face panels and comprising elastic material whereby said case fits over different-sized bundles of fibers, and wherein said case has a substantially circular open upper end in the form of a neck for accommodating the broomstick and a substantially elongated rectangular open lower end for accommodating the bundle of fibers.

4,152,806

TOOTHBRUSH

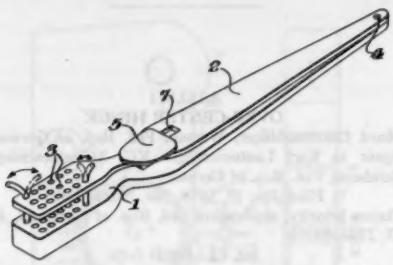
Helmut Raaf, Bad Schwalbach, and Oskar Heumann, Wiesbaden-Klarenthal, both of Fed. Rep. of Germany, assignors to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed May 9, 1978, Ser. No. 904,275

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721352

Int. Cl.[2] A46B *15/00*

U.S. Cl. 15—169 4 Claims



1. A toothbrush having an adjustable operative bristle length comprising

(a) a brush having an elongated handle and a brush head comprising bristles secured in a base,

(b) a perforated plate disposed over said base with the bristles extending through the plate perforations, said plate having an elongated arm which is secured to said handle at the end opposite the perforated plate, and

(c) means for raising and lower said plate along the bristle length which is disposed between said handle and said arm.

4,152,807

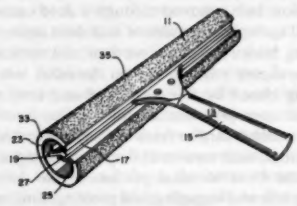
SCRUBBING ATTACHMENT FOR A SQUEEGEE

Michael A. Smahlik, Oakland, Calif., assignor to Steccone Products Co., Inc., Oakland, Calif.

Filed Sep. 29, 1977, Ser. No. 837,832

Int. Cl.[2] A47L *1/08*

U.S. Cl. 15—246 4 Claims



1. An improved scrubbing attachment for a squeegee having a handle secured to a support channel which holds the wiping blade of the squeegee, the improvement comprising

an elongated substantially rigid cylindrical sleeve having a longitudinal slot disposed through a side wall for the length thereof, said sleeve formed of a material which urges the edges of the slot together to grasp at least a portion of the support channel of the squeegee yet is flexible enough to permit the squeegee to be inserted therebetween, said sleeve defining an inner chamber which substantially surrounds the support channel and wiping blade of the squeegee and protects the wiping edge of said blade against contact with said attachment,

a pair of inwardly projecting flanges formed on the edges of said slot of said sleeve and extending substantially along the length of said slot for clamping onto the channel portion of the squeegee, said flanges having a partially curved configuration which conforms to a portion of the external configuration of the support channel of the squeegee to partially surround and clamp onto it to stabilize the sleeve in relation to said squeegee when secured thereto, and

a relatively thick material having sponge-like qualities absorbent to cleaning solutions secured to the external surface of said sleeve and having a uniform thickness and a permeable external texture particularly adapted for scrubbing flat surfaces.

4,152,808

HEATING UNIT FOR WINDSHIELD WIPER

James Andregg, Eagle, Id., assignor to Clear-Vu, Inc., Nampa, Id.

Filed Feb. 9, 1978, Ser. No. 876,485

Int. Cl.[2] B60S *1/04*

U.S. Cl. 15—250.07 5 Claims

1. A heating unit for a windshield wiper assembly having pressure applying linkage elements comprising: a longitudinal resilient element having a flat upper surface with lateral wing portions adapted to be secured by the pressure applying linkage elements,

integral portions downwardly depending and then horizontally extending inwardly forming a rectangular chamber with an open necked portion adapted to receive a wiper blade and

a thin, flat resistance element embedded in each of said inwardly extending portions and extending longitudinally and parallel to said upper surface.

4,152,809

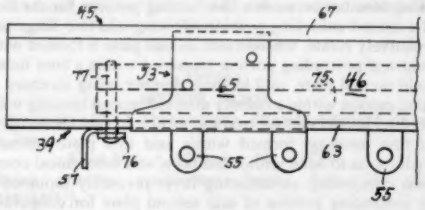
TRAVERSE-ROD CONSTRUCTION FOR AUTOMATICALLY PROVIDING EVEN FOLDING AND UNFOLDING OR DRAPERY SUPPORTED THEREBY

Joseph R. Wertepny, 1614 Parnell St., Marinette, Wis. 54143

Filed Apr. 25, 1977, Ser. No. 790,849

Int. Cl.[2] A47H *5/04*

U.S. Cl. 16—96 D 1 Claim



1. A device for supporting drapery or like foldable material for lateral hanging movement in covering or uncovering a vertical area, comprising: horizontally disposed guide means, a plurality of separable drapery-type hanger elements movably carried by said guide means, and lazy-tong means interconnecting at least most of said hanger elements for automatically

evenly spacing said hanger elements so as to prevent uneven folding or unfolding of said material during uncovering or covering of the area coverable by said material, the end one of said hanger elements being a sheet-material member having a horizontally disposed major portion and a leading-edge-depending plural-apertured drapery-hook-receiving flange extending beneath and substantially at right angle transversely and for more than half the width of said guide means, said guide means being an elongated tubular member wider than tall and housing said lazy-tong means horizontally disposed therein, said hanger elements being supported from the lower ends of lazy-tong pivot pins extending downwardly through a longitudinal slot in the bottom wall of said tubular member, said elongated tubular member being rearwardly open and said sheet-material member having a longitudinally extending upturned flange guidingly engaging at least one margin of the rear opening in said tubular member to maintain the substantially right-angle orientation of the depending flange of said sheet-material member.

4,152,810

AUTOMATICALLY INTERLOCKABLE HINGE

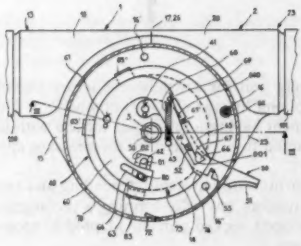
Ginez Martinez, Noisy le Sec, France, assignor to Salanon S.A., Romainville, France

Filed Dec. 29, 1977, Ser. No. 865,571

Claims priority, application France, Aug. 26, 1977, 77 26116

Int. Cl.[2] E05D *11/10*

U.S. Cl. 16—144 **11 Claims**



1. A lockable hinge adapted for being selectively locked in several predetermined angular positions, comprising : two hinge parts having ends adapted for connection to structural components of a hinged assembly, said hinge parts being mounted for relative rotation around a common hinge axis with sliding contact between two plates formed in said hinge parts and having a partially circular contour, a first of said plates being formed with a plurality of first angularly spaced openings for receiving a locking member which is slidably mounted in the second of said plates; actuable and lockable mechanical control means comprising a return resilient member being provided for controlling the displacement of said locking member between a first locking position for the hinge and a second unlocking position allowing said two hinge parts to relatively rotate, wherein said second plate is formed with a cylindrical protruding portion journaled within a bore formed in said second plate, said locking member being mounted for sliding motion within a radially directed second opening which is formed within said protruding portion of said second plate, said first openings formed within said first plate extending radially so as to open within said bore, said mechanical control means comprising an actuating lever pivotedly mounted on said protruding portion of said second plate for cooperation with a locking link having two ends and which is also pivotedly mounted on said protruding portion of said second plate and which is hingedly connected by one of said ends to said locking member so as to control the sliding movement thereof between said two positions, said actuating lever comprising a protruding portion adapted for cooperation with a stop member formed at the other of said ends of said link opposite to said first end with respect to the pivoting axis of said link on one hand for controlling said displacement of said link against the biasing force of a return spring tensioned between said first end of said link and said protruding portion of said second plate, and on the other hand for latching said lever and said link in a latched position of relative positive engagement corresponding to said unlocked position of said locking member, means being provided for automatically releasing said lever and said link from said latched position.

4,152,811

OVER-CENTER HINGE

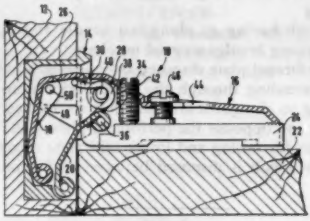
Gerhard Lautenschläger, Wersau, Fed. Rep. of Germany, assignor to Karl Lautenschläger KG, Möbelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 873,076

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703489

Int. Cl.[2] E05D *3/06*

U.S. Cl. 16—164 **2 Claims**



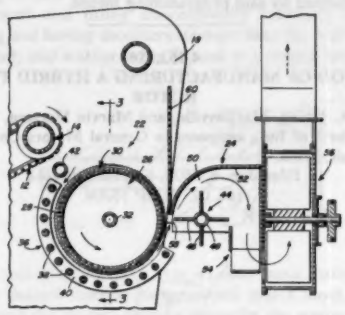
1. An over-center hinge for cabinet doors, comprising: two hinge links pivotingly joined, in the manner of a quadruple knuckle joint, at one end to a door-related hinge member and at the other end to a wall-related hinge member in the form of an elongated supporting arm; said supporting arm having a door end, said hinge in the swing from its closed position to its open position, being moved through a dead center position; a torsion coil spring; on one side of said dead center position said hinge being biased by the tension of said torsion coil spring toward the closed position and on the other side thereof said hinge being biased by the tension of said torsion coil spring toward the open position; a prolongation provided on that hinge link which is farther from the wall related hinge-member than the other, said torsion coil spring having a first leg disposed in the front terminal portion of the door end of the supporting arm and engaging said prolongation, said prolongation forming with the pivot axle at the supporting arm end of said one link a lever arm which is directed away from the pivot axle such that, when the hinge is in the closed position, it is biased for swinging in the closing direction and, when the hinge is in the open position, it is biased for swinging in the opening direction, said torsion coil spring being disposed between the pivot axes on the supporting arm ends of the hinge links, and having a second spring leg supported by said supporting arm, said first spring leg having a terminal portion bent over approximately at right angles into a position parallel to the hinge link pivot axes, said second leg of the torsion coil spring being supported by the pivot axle on the supporting arm end of the hinge link closest to the wall-related hinge member, a pin holding said torsion coil spring in the supporting arm, said pin extending parallel to the pivot axes of the hinge links and passing through the spirals of the torsion coil spring.

4,152,812

COTTON CLEANING ATTACHMENT FOR COTTON SCRAPER

Dolph L. Goodin, 1923-2nd Ave. #12, Yuma, Ariz. 85364

Filed Jul. 18, 1977, Ser. No. 816,908
Int. Cl.[2] D01B *1/00*
U.S. Cl. 19—203 1 Claim



1. In combination with a cotton scraper including a conveyor arranged for discharging cotton, dirt and trash at an elevated discharge end of the conveyor, and a frame supporting the conveyor, a cotton cleaner, comprising, in combination:

(a) separator means mounted on the frame of the scraper at the discharge end of the conveyor for receiving cotton, dirt and trash downwardly under the force of gravity from the conveyor and separating the dirt and trash from the cotton and cleaning the latter, the separator means including a drum rotatably mounted on the scraper beneath the discharge end thereof, and having an outer circumferential surface provided with sawteeth arranged for grasping the cotton, the separator means further including a cage arranged beneath the drum at least half way around the circumferential surface of the drum from adjacent the discharge end of the scraper for retaining cotton on the drum while permitting dirt and debris to fall away from the drum, the cage including a plurality of spaced, substantially parallel rods curved around the drum in conformance with the outer circumferential surface thereof, but spaced from the outer circumferential surface a distance permitting the rods to form a comb facilitating cleaning of the cotton; and

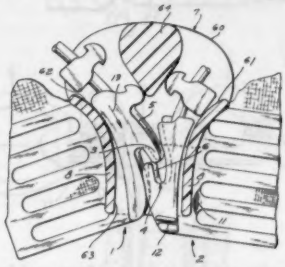
(b) transfer means mounted on the frame of the scraper adjacent the separator means for removing cleaned cotton from the separator means, the latter being arranged between the conveyor and the transfer means, the cage further including a pipe mounted on the scraper and disposed between an adjacent end one of the rods and the discharge end of the scraper, the pipe having a diameter larger than a diameter of the rods for facilitating guidance of the cotton, dirt and debris against the outer circumferential surface of the drum, the transfer means including a fan means rotatably mounted adjacent the separator means, and spaced from the discharge end of the scraper, for removing upwardly moving cotton from the separator means at a point the level of the pipe, the latter being disposed between the fan means and the discharge end of the scraper.

4,152,813

SLIDE FASTENER WITH SEPARABLE END MEMBERS

Helmut Heimberger, Locarno, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

Filed Jun. 6, 1977, Ser. No. 804,147
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 2628165; Oct. 6, 1976, 2644965
Int. Cl.[2] A44B *19/36*
U.S. Cl. 24—205.11 F 3 Claims



1. In a slide fastener having a pair of support tapes each provided with a row of interdigitable coupling heads, respective end stop members at corresponding ends of the respective row, and a slider shiftable along said rows to connect and disconnect said rows of heads, and wherein, further, said end stop members engage one another in a connected condition with line contact, one of said end stop members being constituted as an insertion member having a nose turned away from the respective row of heads, the other end stop member being constituted as a reception member and formed with a hook open toward the respective row of heads and adapted to receive said nose, the improvement wherein:

said end stop members are provided over the entire length of their line of contact with mutually engaging steps for guiding said nose into said hook and positioning said end stop members in a connected condition;

said insertion member is provided with a curved rear flank concave away from said nose and engageable with a convexly curved surface of said slider for enabling said insertion member to be guided by said slider into engagement with said reception member when said slider is on said reception member;

said reception member has a rear flank concave away from said hook;

said reception member is provided with a position element spaced laterally from its rear flank and adapted to engage said slider when said slider is positioned on said reception member; and an abutment is formed on said reception member in the path of said slider upon its movement away from said row and below said hook to restrict withdrawal of said slider from said fastener.

4,152,814

SWIVEL HOOK

Miyotsugu Ito, 172-2, Shimokosaka, Higashiosaka-shi, Osaka-fu, Japan

Filed Mar. 1, 1978, Ser. No. 882,892
Claims priority, application Japan, Aug. 11, 1977, 52/108718[U]
Int. Cl.[2] A44B *13/00*
U.S. Cl. 24—241 PS 1 Claim

1. A swivel hook comprising:

a hollow tubular body with a longitudinal opening adjacent one end thereof and an axial slit at the end thereof opposite said longitudinal opening, said axial slit being disposed diagonally with respect to said longitudinal opening;

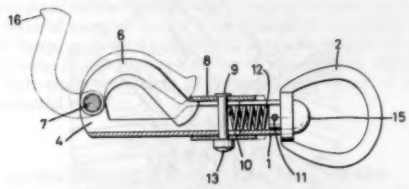
a hook member pivotally mounted onto said tubular body at the end thereof containing said longitudinal opening, the

tip of said hook opposite the end pivotally mounted onto said body being movable into and out of said longitudinal opening;

a swivel mounted on the end of the said body opposite the end containing said longitudinal opening;

locking means surrounding said tubular body for locking said hook member inside said longitudinal opening when said hook member is pivoted thereinto, said locking means being comprised:

a locking pipe slidably mounted around said tubular body



and movable toward and away from said longitudinal opening, and

a shaft member extending through and beyond said locking pipe and said body through said axial slit to limit the axial movement of said locking pipe and to provide a pulling flange to slide said locking pipe along said body; and

biasing means captively contained within said tubular body between said shaft member and said swivel for biasing said shaft member and said locking pipe away from said swivel.

4,152,815

APPARATUS FOR DIVIDING WARPS WITH LEASES

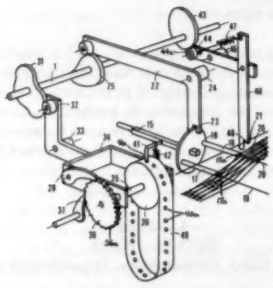
Alois Altenweger, Uster, Switzerland, assignor to Zellweger Uster Ltd., Uster

Filed Mar. 16, 1978, Ser. No. 887,439

Claims priority, application Switzerland, Jun. 24, 1977, 7763/77

Int. Cl.[2] **D02H** *9/00*

U.S. Cl. 28—198 **10 Claims**



1. An apparatus for separating warp threads by means of leases, comprising:

a first divider element for separating an edge warp thread of a sheet or warp threads;

lease means cooperating with said warp threads;

said first divider element separating the edge warp thread out of the sheet of warp threads in conjunction with said lease means such that after separation of the edge warp thread said first divider element changes its position relative to the sheet of warp threads in such a manner that all threads following the edge warp thread are displaced away from said edge warp thread;

means for controlling operation of said first divider element;

a second divider element for engaging the thread separated by the first divider element;

means for controlling operation of said second divider element;

said controlling means for said first divider element comprising programming means for altering the position of the first divider element relative to the sheet of warp threads in a predetermined manner as a function of a program delivered by said programming means.

4,152,816

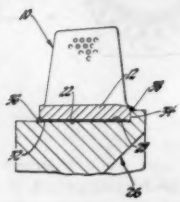
METHOD OF MANUFACTURING A HYBRID TURBINE ROTOR

Bruce A. Ewing, Martinsville, and Marvin Herman, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 6, 1977, Ser. No. 804,142

Int. Cl.[2] **B23P** *15/04*

U.S. Cl. 29—156.8 R **5 Claims**



1. A method for fabricating a hybrid turbine engine wheel assembly comprising: preforming a bladed metal ring from superalloy material with airfoil blades having an exact dimensional control therebetween to maintain aerodynamic flow paths through the ring and with a base rim having a premachined close tolerance ID and a front side and a rear side, preforming a disc of high strength metal having a controlled OD, press fitting the bladed ring to the disc to form a near line-to-line interface therebetween with continuously circumferentially formed front and rear joint lines and with continuous contact across the full facing surface areas of both the base rim ID and the controlled OD of the disc from the front side to the rear side of the base rim ID thereby to prevent collapse of the interface and resultant loss of dimensional control between adjacent airfoils during a subsequent hot isostatic pressing of the joined bladed ring and disc, sealing the full extent of the joint lines with high melt temperature sealant to maintain a clean press fit at the interface between the outside diameter of the disc and the inside diameter of the bladed ring element and a sealed, pressure tight interface, and to define an exposed exterior planar extent on the bladed metal ring and the disc for receiving direct application of hot isostatic fluid without flow of such fluid into the interface, and thereafter hot isostatically pressing the joined bladed ring and disc by direct fluid pressure across the full exterior planar extent of the joined parts to form a diffused metallurgical bond between the base rim and the disc.

4,152,817

METHOD OF JOINING PLASTIC PIPE TO OTHER PIPE

Roger C. Cotten, 299 Vincent St., Metairie, La. 70002

Continuation-in-part of Ser. No. 728,232, Sep. 30, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 872,837

Int. Cl.[2] **B21D** *53/00;* **B21K** *29/00;* **B23P** *15/26*

U.S. Cl. 29—157 R **2 Claims**

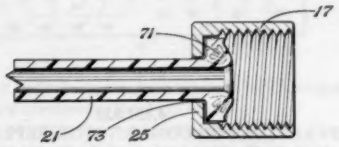
1. A method of joining plastic conduit to a second conduit of another material comprising the steps of:

a. forming a holding means on the end of said second conduit with which said plastic conduit is to be connected;

b. emplacing about a tubular end of said plastic conduit a fitting that is adapted to be fitted against said holding means and having an interiorly protruding annular flange means for pulling said tubular end into engagement with said end of said second conduit;

c. heating said tubular end of said plastic conduit to its softening temperature;

d. forming from the softened tubular end of said plastic conduit a washer on said plastic conduit; said washer being formed of said plastic conduit so as to be integral therewith and fitting concentrically interiorly of said fitting and having shoulders stronger than the wall of said conduit; said washer being formed as a shaped piece by:



i. accordioning said wall over a center piece maintaining the desired internal diameter and into a mold cavity having the desired exterior shape for the washer; and

ii. compressing said accordioned wall back over the heating line formed between the heated, softened wall and the unsoftened wall so as to encompass said heating line and form a shaped piece that seals with said conduit and has inherent springingness to retain in place a frictionally tightened fitting; and

e. tightening said fitting onto said holding means with said washer disposed interiorly of said fitting and with the end of said second conduit compressed into tight sealing relationship with said washer.

4,152,818

MAKING MECHANICAL TUBE JOINTS

Charles B. Mort, Findlay, and Robert E. Anthony, Mount Blanchard, both of Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Filed Jul. 14, 1977, Ser. No. 815,582
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 C **13 Claims**

1. A method of establishing by mechanical means a leak tight joint between a tube and shell type heat exchanger, including:

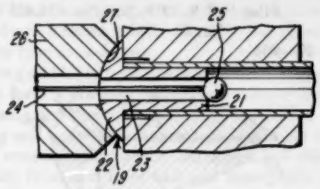
a. providing a header plate with a through tube accommodating hole therein;

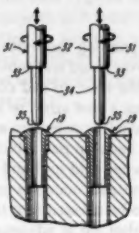
b. providing a tube made of a deformable metallic material and having an outside diameter approximately the same as the hole diameter in the header plate;

c. inserting an end of said tube into the hole in the header plate so that it is received therein with an extremity at or adjacent to an exterior face of said header plate;

d. installing in an inserted tube end through said exterior face a metallic ferrule including a cylindrical body portion having an outside diameter approximately the same as the inside tube diameter and positioning said cylindrical body portion of said ferrule in said tube end in a longitudinal sense so that an outer end thereof substantially agrees with the extremity of said tube end; and

e. in first and second metal working steps applied in axial thrusts directed reversely of one another effecting first an initial expansion of said ferrule to deform the surrounding tube end into close fitting contact with a header plate wall surface defining said through hole, and second a subsequent further expansion of said ferrule additionally to





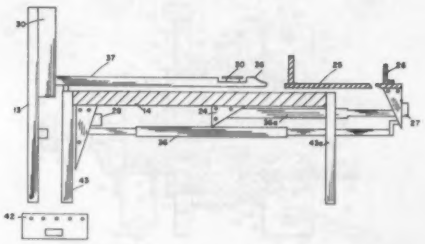
deform the tube end into sealing contact with said hole defining wall surface.

4,152,819

MACHINE FOR DISASSEMBLING WOOD PALLETS

Neil E. Conkle, 1000 Clarendon, Columbus, Ohio 43223

Filed Jul. 1, 1977, Ser. No. 812,418
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—252 **10 Claims**



1. A machine for disassembling wood pallets of the type having deck baseboards and stringers comprising a structure for breaking the nails holding said boards to said stringers including;

a platform for placing said pallet thereon;

engaging arm means

nail breaking means including a pair of discs;

means for mounting said pair of discs on the end of said arm engaging means in a side by side relationship and in a displaced horizontal plane relative to one another so that their edges overlap, means for positioning said arm engaging means above said platform to a height wherein said discs are on a plane equivalent to that of the joining point of said stringers to said baseboards when said pallet is placed on said platform;

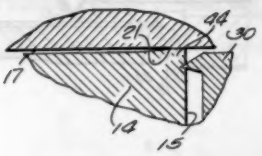
drive means for moving said platform horizontally to engage said discs with the nails extending from said deckboards into said stringer and to continue said movement until all of said nails are broken.

4,152,820

METHOD OF EXPANDING SHOT TIP

LeRoy D. Dorzok, Rte. 1, 1511 Shalom Rd., Kewaskum, Wis. 53040

Filed Feb. 9, 1978, Ser. No. 876,455
Int. Cl.[2] B23Q *17/00*
U.S. Cl. 29—404 4 Claims



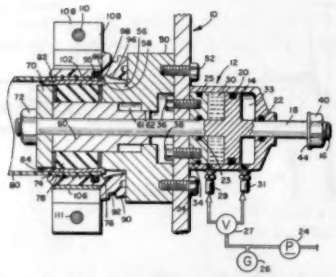
1. A method of expanding the shot tip of a shot plunger in a die cast machine having fixed and movable die halves to maintain a seal between the shot tip and cold chamber comprising the steps of providing a tool sized to interfit in said chamber, said tool having an axially projecting annular beveled deforming rim, providing a back-up pad which interfits in said chamber in the space between said tool and the movable die half of said die cast machine and occupies said space to cause said deforming portion to be pressed into the adjacent face of said shot tip when said shot tip is advanced, and advancing said shot tip against said deforming tool to press said deforming rim into said shot tip to expand the periphery of said shot tip into a sealing fit with said cold chamber.

4,152,821

PIPE JOINING CONNECTION PROCESS

William J. Scott, 1901 Lanai Dr., Costa Mesa, Calif. 92626

Division of Ser. No. 662,724, Mar. 1, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 804,885
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—421 R 2 Claims



1. A process for adapting a fitting to a plastic pipe comprising:
- sizing a pipe that is to be fitted to an appropriate size for receipt of a fitting thereon;
- placing a metal sleeve within the end of said pipe that is to be fitted;
- placing an adapter fixture having a series of interior grooves along the inside surface that is to be received on the outside of said pipe over the outside circumferential end thereof that has been sized to the adapter fixture;
- placing a circumferentially elastomeric expandable material within said sleeve;
- providing a hydraulic cylinder for compressively driving the elastomeric expandable material;
- expanding said material outwardly against the interior surface of said sleeve and attendantly expanding the plastic of the pipe against the adapter fixture to cause the plastic of said pipe to cold flow into the interior grooves of said adapter;
- controlling the expansion of said pipe and said sleeve beyond a given point; and,
- retaining the expansion of said sleeve and plastic of the pipe by means surrounding the pipe and adapter fixture wherein the inner sleeve is expanded in a force relationship against said means to a point of mutual stress between the sleeve and the retaining means.

4,152,822

APPARATUS FOR COMMUTATOR REPLACEMENT

Donald H. Duff, 35936 Leon, Livonia, Mich. 48150

Filed Aug. 4, 1977, Ser. No. 821,718
Int. Cl.[2] H02K *15/00*
U.S. Cl. 29—564.5 8 Claims

1. A kit for replacing a commutator having contact wires which abut against and are soldered to mating contact wires on an armature having a shaft, said kit comprising
- a platen having means for holding said commutator when attached to the armature,
- means for heating the platen to thereby melt the solder,
- means for removing the commutator from the armature shaft and wires,
- means for spreading the armature contact wires radially outwardly,
- means for positioning a new commutator on said armature over said shaft, said new commutator having a radially outwardly extending slotted portion with electrical contact wires, so that the slotted portion of the new commutator is interspaced between the armature contact wires, and
- means for soldering the new commutator to the armature contact wires wherein said spreading means further comprises a tool having two elongated handles pivotally secured together at a midpoint, a head mounted to the adjacent ends of each handle, each head having a substantially semicircular outer and inner periphery, said heads being in a facing relationship whereby the armature shaft can be received through the bore formed by the inner periphery of the heads so that the outer periphery of the heads are spaced radially inwardly from the armature contact wires.

4,152,823

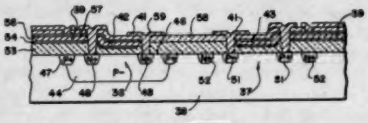
HIGH TEMPERATURE REFRACTORY METAL CONTACT ASSEMBLY AND MULTIPLE LAYER INTERCONNECT STRUCTURE

John H. Hall, Saratoga, Calif., assignor to Micro Power Systems, Santa Clara, Calif.

Division of Ser. No. 585,612, Jun. 10, 1975, Pat. No. 4,042,953, which is a continuation of Ser. No. 384,640, Aug. 1, 1973, abandoned. This application Apr. 28, 1977, Ser. No. 791,798

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **1 Claim**



1. A method of forming a complementary MOS integrated circuit structure comprising the steps of:

providing an N type silicon body having a surface,

forming a P− region in the surface of the body,

forming spaced N+ regions within the P− region,

forming spaced P+ regions in the surface of the body,

forming isolation rings in the surface of the body surrounding and isolating said transistors,

forming a first insulating layer on the surface of the body,

forming a refractory metal sandwich on the upper surface of the first insulating layer,

formation of said sandwich including the steps of forming a first silicon layer on the upper surface of the first insulating layer, forming a relatively thin refractory metal layer on the first silicon layer, and forming a second silicon layer on the upper surface of the refractory metal layer,

providing one portion of the refractory metal sandwich which overlies the body surface between the spaced P+ regions to form the P channel transistor gate,

providing another portion of the refractory metal sandwich which overlies the body surface between said spaced N+ regions to form the N channel transistor gate,

forming a second insulating layer on the upper surface of the refractory metal sandwich,

forming an additional metal layer on the upper surface of the second insulating layer,

selectively dividing the refractory metal sandwich and the additional metal layer into portions having interconnecting segments which extend through intervening layers to selectively interconnect portions of the metal layers and selectively contact the upper surface of the transistor regions to form an integrated circuit.

4,152,824

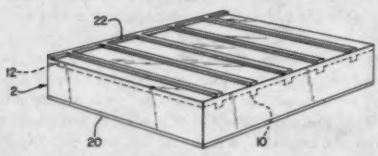
MANUFACTURE OF SOLAR CELLS

Ronald Gonsiorawski, Danvers, Mass., assignor to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Dec. 30, 1977, Ser. No. 865,953

Int. Cl.[2] H01L *21/223, 21/225*

U.S. Cl. 29—572 **19 Claims**



1. A method of making a photovoltaic semiconductor solar cell comprising the steps of:

(1) providing a semiconductor body of a first conductivity type and having first and second opposite surfaces;

(2) forming on said first surface a continuous layer of a material containing a dopant capable upon diffusion into said body of forming a region of a second opposite conductivity type in said body;

(3) removing said layer from selected portions of said surface so as to form a grid-like pattern of apertures defined by intervening non-removed sections of said layer;

(4) heating said body in an atmosphere containing said dopant at a temperature at which said dopant will diffuse into said body from said layer and said atmosphere so as to form in said body relatively deep diffused regions of opposite conductivity type in line with said apertures and relatively shallow diffused regions of said opposite conductivity type in line with said intervening layer sections, said regions establishing a junction within said body; and

(5) forming conductive contacts on said surfaces with the contacts on said first surface conforming to and overlying said deep diffused regions.

4,152,825

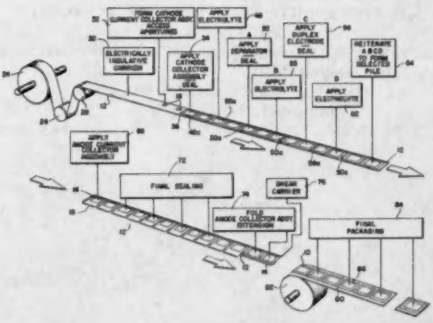
METHOD OF MAKING A FLAT BATTERY

Louis O. Bruneau, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 10, 1974, Ser. No. 478,106

Int. Cl.[2] H01M *6/00*

U.S. Cl. 29—623.2 **17 Claims**



1. A method for constructing flat battery units comprising the steps of:

providing first current collectors, each having a lengthwise and widthwise dimension;

providing a continuous carrier sheet of electrically insulative material having a widthwise dimension at least as great as the widthwise dimension of said first current collectors;

intermittently depositing in predetermined spaced sequential alignment upon one side of said continuous carrier sheet said first current collectors; thereon depositing in a predetermined sequence superposed on each first current collector electrolyte, anode materials, cathode materials, separators and intercell connectors; and thereon depositing a second current collector to form discrete electrically coupled flat cell assemblies; and

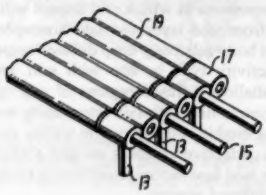
cutting said continuous carrier sheet between said discrete cell assemblies to provide discrete battery units comprising a sheet of electrically insulative material at least coextensive in size with a first current collector.

4,152,826

METHOD FOR SEPARATING THE GROUND AND SIGNAL CONDUCTORS IN A PLURAL CONDUCTOR FLAT CABLE

Harry B. Mueller, Hollywood Hills, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 15, 1978, Ser. No. 905,717
Int. Cl.[2] H01B *13/00*
U.S. Cl. 29—624 6 Claims



1. A method of stripping insulation from selected conductors in an insulated multiple conductor flat cable and for separating the selected stripped conductors from the remaining conductors in the cable comprising the steps of:

severing a portion of insulation from said cable along a line transverse to the length of said cable;

sliding said severed portion along said conductors away from the main body of the cable;

removing selected conductors from said severed portion; and

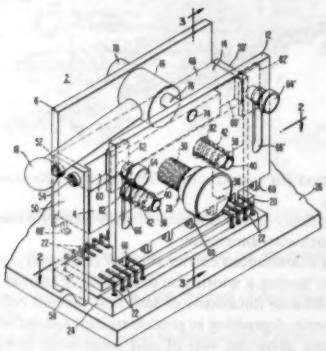
returning said severed portion along said non-removed conductors to abut the main body of said cable.

4,152,827

TOOL FOR REMOVING INTEGRATED CIRCUIT PACKAGES

Charles E. Walton, II, Downingtown, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 1, 1978, Ser. No. 901,586
Int. Cl.[2] H05K *13/04, 3/30*
U.S. Cl. 29—764 16 Claims



1. A tool for removing an integrated circuit package of the type having a first and second plurality of equally spaced-apart pins affixed along a first pair of parallel sidewalls, said circuit package further having a second pair of parallel sidewalls which extend between said first pair of parallel sidewalls, said tool comprising:

a limiting block having first and second pairs of opposed sides;

first gripping means, connected to the first of said first pair of opposed sides, said first gripping means for grasping an underside of said circuit package about at least one pin of said first plurality of pins;

second gripping means, engagable with the second of said first pair of opposed sides, for grasping an underside of said circuit package about at least one pin of said second plurality of pins;

arm closing means for moving said second gripping means between a retracted position and an engaged position, whereby said second gripping means is engaged against the second of said first pair of opposed sides when said second gripping means is in the engaged position and said second gripping means is remote from the second of said first pair of opposed sides when said second gripping means is in the retracted position;

alignment head means, positioned above said limiting block, whereby said limiting block is nested and floating within said alignment head means, said alignment head means for aligning said first and second gripping means in position to grasp the underside of said circuit package; and

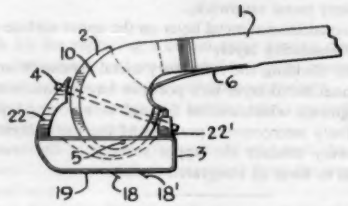
camming means, journaled between the opposing inner surfaces of said first and second gripping means above said alignment head means, for simultaneously raising said first and second gripping means with respect to said alignment head means.

4,152,828

RAZOR HAVING VARIABLE ANGLE AND TILT OF ITS BLADE

Lloyd W. Lund, Chapel Rd., Waldoboro, Mass. 04572

Filed Mar. 29, 1978, Ser. No. 891,313
Int. Cl.[2] B26B *21/52*
U.S. Cl. 30—89 10 Claims



1. A razor including a handle and an elongated blade holder with at least one razor blade longitudinally extending substantially parallel to the longitudinal direction of said holder, comprising in combination:

a universal joint having an outer fork firmly connected to one end of said handle,

a tiltable central joint member tiltably supported in said outer fork for swinging movement about a first axis,

an inner fork firmly connected to said blade holder, said inner fork with the blade holder being tiltably supported in said tiltable central joint member for swinging movement about a second axis, said second axis defining an angle of less than ninety (90°) degrees with said blade holder and extending above said first axis, and disposed in a plane substantially perpendicular to said first axis, and

positioning means for resiliency urging said central member and said blade holder to a neutral shaving position.

4,152,829
CLOTH CUTTER WITH SHARPENER AND CLOTH CONTACTING PARTS ARE TEFLON COATED

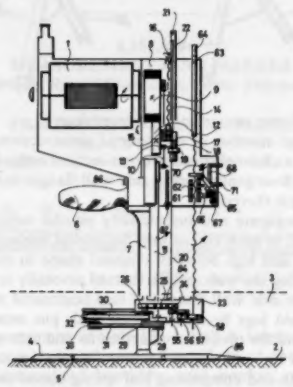
István Dömök; Olivér Kocsis; Miklós Bánszki, and Jenó Horváth, all of Budapest, Hungary, assignors to Csepel Muvek Jarmu- Es Konfekcioipari Gepayara, Budapest, Hungary

Filed Mar. 2, 1978, Ser. No. 882,898

Claims priority, application Hungary, May 4, 1977, CE 1131

Int. Cl.[2] B26B *7/00*

U.S. Cl. 30—139 **2 Claims**



1. Cloth-cutting machine with a sword-knife, driven by an electromotor and provided with a band sharping device and with components being in contact with the cloth-sheet to be cut, f.i. with a carrying plate, a tilting plate, a foot and a cloth pressing foot, characterized in that in the sharping head (**23**) band tensioning arms (**44,45**) are arranged, and on said arms the changeable heads (**49,50**) are mounted, furthermore the machine is provided with a control spindle (**47**) which is performing regulation by means of a tension spring (**46**) and a nut bolt (**48**), while the rod (**72**) pressing the cloth in an elastic manner is provided with the toothed retaining member (**78**), with the casing (**77**) leading the same, with the spring (**79**) built into the casing (**77**), with the retaining lever (**75**), a further spring (**76**) and with an arm turnable on the pinned screw (**80**) and serving for the release of the retaining member (**78**).

4,152,830
HAIR-CUTTING

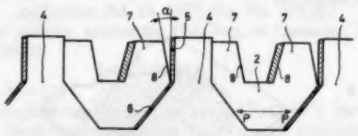
Albert J. Meijer, and Albertus P. Rentema, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,745

Claims priority, application Netherlands, Jan. 19, 1977, 7700504

Int. Cl.[2] B26B *19/22*

U.S. Cl. 30—195 **4 Claims**



1. A hair-cutting apparatus which comprises a drivable cutter; means to drive said drivable cutter; a counter-cutter; the two cutters each having a row of teeth extending substantially transversely to the direction of driving, the cutting edges of two co-operating teeth of the drivable cutter and the counter-cutter enclosing a cutting angle, and the shape of the cutting edges of the teeth of one of said cutters being different from the shape of the cutting edges of the teeth of the other cutter; and means to adjust the position of the two cutters relative to each other in a direction substantially transverse to the direction of driving, the magnitude of the cutting angle thereby varying according to the adjusted position of the two cutters.

4,152,831
TOOL HOLDER

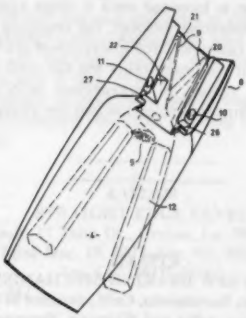
Peter O. Davies, Auckland, New Zealand, assignor to Tullen Industries Limited, Auckland, New Zealand

Filed Dec. 9, 1977, Ser. No. 859,094

Claims priority, application New Zealand, Dec. 15, 1976, 182894

Int. Cl.[2] B26B *19/38*

U.S. Cl. 30—231 **14 Claims**



1. A holder for a scissor-like tool whose reciprocable blades are biased to an open position by means of a spring comprising a mounting portion adapted to be secured to or to rest upon a support, and a tool gripping portion adapted to hold a tool in the holder by the spring pressure of the tool causing the tool to co-act against the tool gripping portion.

4,152,832
CORD-TYPE CUTTING DEVICE OF MOWING APPARATUS

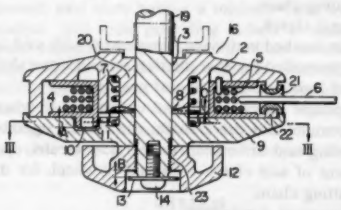
Junichi Akaike, Chofu, and Masatoshi Sato, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 879,850

Claims priority, application Japan, Nov. 26, 1977, 52-157885[U]

Int. Cl.[2] A01D *55/18*; A01G *3/06*

U.S. Cl. 30—276 **2 Claims**



1. A cord-type cutting device of mowing apparatus comprising:

a cord reel having mounted thereon a cord serving as a cord blade and formed on its underside with at least one engaging projection;

a cord reel casing including a hub for rotatably fitting said

cord reel thereon and a cord pay-out port for paying out the cord to provide a cord blade of a desired length;

a lower cover formed on its upper surface with an engaging recess adapted to receive said engaging projection therein;

said cord reel casing and said lower cover each being formed with engaging portions at their interface where the cord reel casing and the lower cover are brought into and out of engagement with each other against the biasing force of a compression spring;

a main shaft extending through the hub of said cord reel casing and said lower cover and being formed at its lower end portion with an externally threaded portion for threadably fitting thereon a nut so as to permit these parts to act as a unit; and

a nut dislodging preventing member attached to a lower end of said main shaft and providing the externally threaded portion with a loosening allowance for said nut, so that when said nut is loosened until it abuts against the nut dislodging preventing member, the engaging portions of the cord reel casing and the lower cover are brought out of engagement with each other but the cord reel and the lower cover remain in engagement with each other through the engagin projection and the engaging recess.

4,152,833

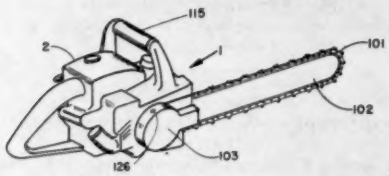
CHAIN SAW BRAKING MECHANISM

William R. Phillips, Sacramento, Calif., assignor to Crow, Lytle, Gilwee, Donoghue, Adler and Weineger, Sacramento, Calif.

Filed Jun. 22, 1977, Ser. No. 808,734

Int. Cl.[2] B27G *19/00*

U.S. Cl. 30—382 **13 Claims**



1. In a chain saw having a housing, and an engine in said housing, an activation means for the engine, a chain bar connected to said housing, a cutting chain operably carried by said chain bar;

said engine including a drive shaft, operably connectable to said cutting chain,

a centrifugal clutch,

gear means meshed in driving engagement with said cutting chain, journalled for free rotation on said drive shaft,

a flywheel rigidly secured to said gear means,

said centrifugal clutch positioned within said flywheel and connected to said drive shaft, said clutch operable for connecting said drive shaft to said gear means, upon engagement of said clutch with said flywheel, for driving said cutting chain,

the improvement comprising;

(a) electromechanical means for sensing movement of the chain abruptly from a predetermined direction to another direction, and for providing an electrical signal in response thereto;

(b) means responsive to said electrical signal for activating a brake system to disengage and to stop the driving of the cutting chain.

4,152,834

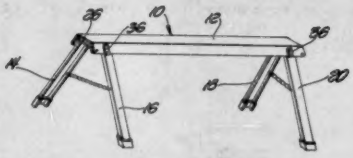
SAW HORSE CONSTRUCTION

Robert F. Stansberry, 18584 Fitzpatrick, Detroit, Mich. 48228

Filed Oct. 13, 1977, Ser. No. 841,883

Int. Cl.[2] F16M *11/00*

U.S. Cl. 182—155 **1 Claim**



1. A saw horse construction, comprising:

a horizontal member of sheet metal construction formed to provide a channel shape in cross-section and with depending and divergently spread side wall flanges extending the full length thereof,

a pair of separate and individually pivotal supporting legs provided at each end of said horizontal member and with each of said legs being of channel shape in cross section and having the web section thereof pivotally connected to the inner side wall flanges of said horizontal member,

each of said legs being provided with pin means at their upper end for pivotal connection to said side wall flanges and having individual locking means in combination therewith and comprising leaf spring biased detent means fixed to each of said pivot pins and disposed for locking engagement with each of said legs through receptive openings provided in said side wall flanges and each of said legs and aligned when said legs are erect and fully extended,

and means for precluding undue spread of said legs when erected and including a length of chain extending between and engaged to oppositely disposed of said legs at each end of said horizontal member together with an end wall strap provided between said side wall flanges at opposite ends of said horizontal member and serving as a stop against pivoted extension of said legs beyond their locking and erected disposition,

said end wall straps being fastened to said flanges at the lower corner ends thereof and extending therebetween for providing added structural rigidity within said horizontal member and each strap having opposite ends adjacent said flanges notched to receive and retain said legs, as erected, relatively fixed and locked in supporting position.

4,152,835

DUAL STEREOGRAPHIC NET

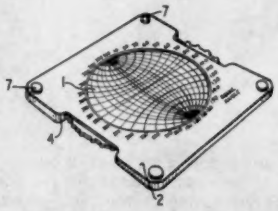
Christopher M. Powell, 6 Elizabeth St., Ryde, New South Wales 2113, Australia

Filed Oct. 18, 1977, Ser. No. 843,179

Claims priority, application Australia, Nov. 8, 1976, PC8050

Int. Cl.[2] B43L *5/00*

U.S. Cl. 33—1 SD **1 Claim**



1. An instrument for making three-dimensional angular calculations in two dimensions by means of a circular base

comprising a circular disc rotatable in a frame, the frame comprising two flat surfaces and four sides and being cut-away on at least one side to expose the edge of the disc to enable it to be rotated, the frame also having a cut-away on each of its flat surfaces to expose the central area of each side of the disc, an equal-angle stereographic net on one exposed central area of the disc, an equal-area stereographic net on the other side exposed central area of the disc, and degrees marked round the cut-away on each of the flat surfaces of the frame, the calculations being made on a transparent overlay fixed to the outside of the frame.

4,152,836

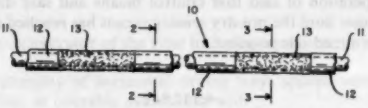
MEASUREMENT LINE MARKER

Marcel Rodrique, Rong 6 Courcelles, Conte' Frontenac, Quebec, Canada

Filed Dec. 22, 1977, Ser. No. 863,112

Int. Cl.[2] B44D *3/38*

U.S. Cl. 33—87 **6 Claims**



1. A measurement line marker which is substantially resistant to changes in length under the effects of changes in tension, temperature and humidity, said marker comprising a continuous length of a thin, flexible, non-stretchable metal wire and a flexible thin sleeve covering said wire, said sleeve comprising a multiplicity of long sleeve segments of plastic material having a thickness which extends outwardly from said wire and has a smooth surface which is substantially non-receptive to marking chalk, and a multiplicity of short sleeve segments having a thickness which extends outwardly from said wire, one each located between two of said long sleeve segments and being separated from each other by predetermined fixed distances, each of said long and short sleeve segments being attached to said wire to negate movement thereof relative to each other or relative to said wire and to negate removal of said segments from said wire, said short sleeve segments having porous surfaces which are receptive to marking chalk whereby when a solid piece of marking chalk is abraded by said measurement line marker portions of said chalk are selectively adhered to said narrow porous sleeve segments and repelled by said long smooth plastic sleeve segments to provide a chalked line marker capable of producing a multiplicity of aligned, accurately spaced narrow chalk marks on a surface.

4,152,837

LENGTH MEASURING DEVICE

Gunther Nelle, Siegsdorf, and Alfons Ernst, Traunreut, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH., Traunreut, Fed. Rep. of Germany

Continuation of Ser. No. 637,596, Dec. 4, 1975, abandoned. This application Jul. 13, 1977, Ser. No. 815,092

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1975, 2510219

Int. Cl.[2] G01B *11/04*

U.S. Cl. 33—125 C **6 Claims**

1. A displacement measuring system for use in measuring relative displacement between two objects, comprising, in combination:

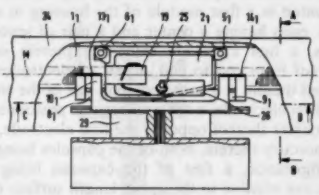
a main guide;

a first member adapted to be secured to one of said objects through said main guide; and including a scale element having a neutral plane and having a series of scale divisions indicated thereon, said scale divisions being spaced apart from said neutral plane and being disposed near said main guide;

a second member movable relative to said first member;

a scanning means comprising a scanning unit guide and a scanning unit movable along said first member along a given imaginary line and operable for scanning said scale element; and

coupling means operable for coupling said scanning unit to said second member stiffly with respect to movement



parallel to said line, and resiliently at right angles thereto, said coupling means comprising at least two substantially parallel and buckling-resistant wire rods whereby said scanning unit is able to move along said first member independently of distortions which might occur to prevent said scanning unit from tracking said scale element precisely.

4,152,838

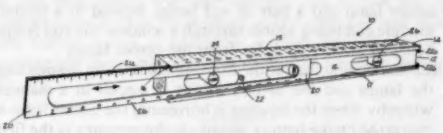
STRAIGHT EDGE LEVEL

Joseph G. Cook, 27 Tulip Dr., Gretna, La. 70053

Filed Dec. 19, 1977, Ser. No. 861,729

Int. Cl.[2] G01B *19/62*

U.S. Cl. 33—342 **7 Claims**



1. A extensible level-rule apparatus comprising:

a. an elongated, substantially rectangular level body, said body being provided with a pair of parallel flat level sides;

b. level bubble means mounted within said level body for indicating when a flat level side is oriented in a substantially level position; said body having a pair of elongated inwardly facing gooves thereon;

c. an elongated slide member slidably mounted on said rule body in said inwardly facing grooves in front of said level bubble means and sliding in coincident relationship with said level body so as to be extensible therefrom, said slide member being provided with a linear scale on the surface thereof, said scale having a minimal value on one edge portion, said scale providing indicia in equally spaced scalar relationship in increasing values toward the other edge portion of said slide member, said slide member having an elongated longitudinal slot therein said level bubble means being visible by sighting through said slot throughout substantially the entire sliding movement of said slide member relative to said body member.

4,152,839

LEVEL INDICATING DEVICE

Edward L. McDonald, 137 Fern St., Newark, Ohio 43055

Filed Mar. 31, 1977, Ser. No. 783,307

Int. Cl.[2] G01C *9/06*

U.S. Cl. 33—366 **1 Claim**

1. A level indicating device for indicating a true horizontal position, a true vertical position and divergences from true

horizontal and vertical positions, said level indicating device comprising:

a housing comprising a plurality of modules and forming a substantially elongated beam-like configuration, the housing having an upper length surface and a pair of end surfaces substantially perpendicular to the upper length surface;

a pair of sealed capsules of electrically insulative material mounted in a first module of the housing in spaced relation, each having a center and a pair of spaced opposite ends, a first electrode extending therein on one side thereof from end to end, a pair of electrodes each positioned therein at a corresponding one of the ends opposite the first electrode, a center electrode positioned therein at the center thereof opposite the first electrode, and a bead of mercury therein, both of the capsules being of arcuate configuration, a first of the capsules being positioned concave relative to the upper length surface of the housing with the center electrode further from the upper length surface than the pair of end-positioned electrodes so that when the housing is horizontal the mercury therein contacts the first and center electrodes thereof and the

second of the capsules being positioned convex relative to one of the end surfaces of the housing with the center electrode closer to said one of the end surfaces than the pair of end-positioned electrodes so that when the housing is vertical the mercury therein contacts the first and center electrodes thereof, each capsule being constructed of sponge rubber and being completely enclosed by plastic; battery means in the housing;

a center lamp and a pair of end lamps located in a second module and being visible through a window the end lamps being of a different color from the center lamp;

electrical conductors in the housing electrically connecting the lamps and the battery means in circuit in a manner whereby when the housing is horizontal the center lamp is energized by the battery means via the mercury in the first capsule, when the housing is at an angle with the horizontal one of the end lamps is energized by the battery means via the mercury in the first capsule, when the housing is vertical the center lamp is energized by the battery means via the mercury in the second capsule and when the housing is at an angle with the vertical one of the end lamps is energized by the battery means via the mercury in the second capsule.

4,152,840

GRAIN DRYER CONTROL SYSTEM

Larry L. Stille, Rockford, Iowa, assignor to David Manufacturing Co., Mason City, Iowa

Filed Aug. 31, 1977, Ser. No. 829,514

Int. Cl.[2] F26B *17/20*

U.S. Cl. 34—56 **17 Claims**

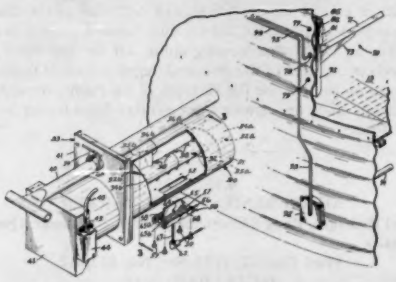
1. A control system for a grain drying system of the type which includes a drying bin, means for circulating drying air therethrough, and a discharge auger for removing dried grain from the bin, comprising:

a pre-dry temperature sensing means positioned in said bin for submersion by grain a short distance above the level of removal thereof by the discharge auger, for sensing the temperature of grain in the bin;

discharge grain temperature sensing means positioning in the discharge auger for sensing the temperature of grain in the discharge auger;

first control means connected to said discharge grain temperature sensing means and said discharge auger for periodically starting the discharge auger to remove grain from the bin and for stopping the auger if the discharge grain temperature sensing means indicates that the grain is below a predetermined temperature; and

second control means connected to said pre-dry temperature



sensing means and said first control means for delaying operation of said first control means and said discharge auger until the pre-dry sensing means has reached a predetermined temperature.

4,152,841

FLOW CONTROL METERS FOR GRAVITY FLOW PARTICLE DRYERS

Christianus M. T. Westelaken, R.R. #1, St. Marys, Ontario, Canada

Continuation-in-part of Ser. No. 729,730, Oct. 5, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,682

Int. Cl.[2] F26B *17/12*

U.S. Cl. 34—167 **4 Claims**

1. In a grain drying tower of the concurrent-countercurrent flow type in which hot drying air travels downwardly in the same direction as the flowing grain and cooling air travels in an opposite direction to the direction of grain travel, with an air exhaust exit at a location intermediate an upper hot air inlet and a lower cooling air inlet, the combination which comprises

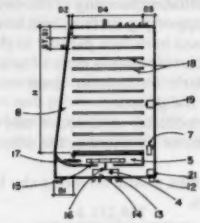
(a) a discharge floor structure at the bottom of the tower comprising a horizontal floor member having a plurality of substantially uniformly spaced apertures of substantially uniform transverse dimension, said apertures being arranged in a plurality of straight rows, a tube member extending downwardly beneath each said aperture, each said tube member having a bottom end closure and a pair of opposed circular openings in all tubes in each row being in axial alignment, a cylindrical sleeve mounted in each said circular opening and a rotatable auger extending axially through each row of sleeves and

(b) a plurality of substantially uniformly laterally spaced, inverted channel members with open bottoms extending across said drying tower immediately above said discharge floor structure, said channel members being adapted to distribute cooling air into the grain in the tower with a said channel member being positioned above and laterally between each pair of adjacent rows of said discharge floor apertures and said channel members being vertically positioned such as to provide a slight downward entrainment of said cooling air through said discharge floor apertures sufficient to substantially prevent accumulation of dust or chaff in said tubes and augers.

4,152,842
DEHYDRATOR

David E. Laughlin, Green River, Wyo., assignor to Laughlin Enterprises, Salt Lake City, Utah

Filed Aug. 4, 1977, Ser. No. 821,830
Int. Cl.[2] F26B 9/06
U.S. Cl. 34—196 9 Claims



1. In a dehydrator of the type including a chamber containing:

(a) a plurality of horizontal drying trays spaced vertically within, in operable association with

(b) a blower adapted to continuously draw into a lower zone of the chamber make up air which replaces a portion of exhausted air displaced out of the chamber through non-variable exhaust portals, depending upon the relative temperature, humidity, and pressure of the ambient air; where it is blended with recirculating air which was drawn into the lower zone of the chamber by the blower from a rear zone of the chamber where the air flowing over the drying trays has collected;

(c) a heating element to heat an air mixture entering the lower zone of the chamber; and

(d) a thermostat to regulate the heating element; the improvement comprising,

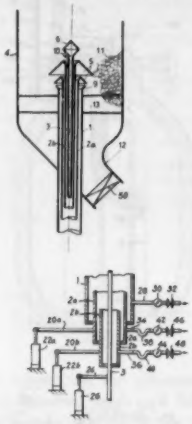
(e) enclosing the chamber with a cabinet having a trapezoidal shape, with a bottom, top, and sidewalls, including a sloping sidewall around said plurality of trays to form a frontal zone within said chamber having a relatively large horizontal cross section in the vicinity of the lower most tray and progressively decreasing horizontal cross sections in the vicinities of each succeeding tray vertically upward within the cabinet so that the heated air mixture expelled from the lower zone by the blower is forced to flow in substantially uniform amounts across the top of each said drying tray.

4,152,843
APPARATUS FOR DELIVERING TREATING GAS TO BULK MATERIAL SUCH AS HOT COKE OR COAL SITUATED IN A CONTAINER

Roland Kemmetmueller, Vienna, Austria, assignor to Waagner-Biró Aktiengesellschaft, Austria

Filed Dec. 27, 1977, Ser. No. 864,435
Claims priority, application Austria, Dec. 30, 1976, 9816/76
Int. Cl.[2] F26B 9/08
U.S. Cl. 34—229 8 Claims

1. In an apparatus for treating bulk material such as hot coke which is to be cooled or coal which is to be dried, container means for containing bulk material during the treatment thereof, a plurality of coaxial pipe means extending into the interior of said container means for supplying one or more treating gases thereto, said plurality of coaxial pipe means respectively including tubular side walls which are spaced from each other to define gas passages between themselves, an elongated bar situated coaxially within the innermost of said pipe means while being spaced therefrom so that a gas can also flow in the interior of the innermost of said pipe means along said bar, moving means operatively connected to at least one of said pipe means and said bar for moving at least said one pipe means and said bar axially for adjusting the axial position of said bar and said pipe means with respect to each other, said plurality of pipe means respectively having open ends in the interior of said container means and respectively being enlarged at said open ends which are displaced axially one with respect to the other upon movement of at least said one pipe means by said moving means, said bar also having in the interior of said container means an enlarged end the position of



which can be changed with respect to the open end of said innermost pipe means upon axial movement of said bar by said moving means connected thereto, whereby operation of said moving means will regulate the positions of said enlarged ends of said pipe means and said enlarged end of said bar with respect to each other for defining at said enlarged ends adjustable outlets acting as adjustable nozzles through which the treating gas flows into the interior of said container means.

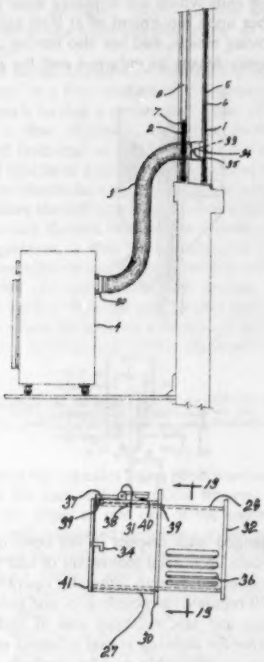
4,152,844
EXHAUST SYSTEM FOR LAUNDRY DRYER

Gizela Materniak, nee Balcerowicz, and Zdzislaw Materniak, both of 7211 Fielding Ave., Apt. 102, Montreal, Canada

Continuation-in-part of Ser. No. 692,686, Jun. 4, 1976, Pat. No. 4,081,915. This application Mar. 1, 1978, Ser. No. 882,311
Int. Cl.[2] F24F 13/18
U.S. Cl. 34—235 8 Claims

1. An air exhaust system for a laundry dryer and the like located in a room having a window including a window frame and a window sash slidable therein, and having an air exhaust outlet, comprising a window insert plate assembly removably inserted within said window frame and with said window sash contacting an edge of said window insert plate assembly, said window insert assembly including telescopically engaged rectangular plate sections to fit window frames of different widths, one of said plate sections having an aperture, a sleeve secured to said window insert plate assembly co-axial with said aperture and extending inwardly of said window insert plate assembly, a tube slidably inserted within said sleeve, a closure disc secured to the outer end of said tube, said tube having a length about twice the length of the sleeve and capable of taking a retracted position with said outer closure disc substantially flush with said window insert plate assembly and a protruding position wherein said tube has an outer portion protruding from said window insert plate assembly, said outer portion having a plurality of openings made in the lower half-portion thereof, means to prevent rotation of said tube with respect to said sleeve but allowing longitudinal movement of said tube within said sleeve, and further including a flexible venting hose having detachable connecting means at both ends for detachably connecting one end of said hose to the inner end of said tube and the other end of said hose to the exhaust outlet of a

laundry dryer, said sleeve and tube assembly preventing air circulation between said room and the outside in both positions



of said tube when said hose is connected to said tube and to said laundry dryer exhaust outlet.

4,152,845

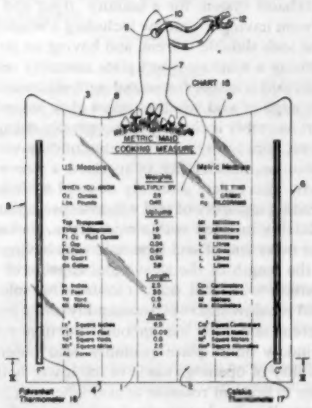
METRIC CONVERSION BOARD

Hershel L. Ezzell, Rte. 2, Box 1924, Porter, Tex. 77365

Filed Feb. 24, 1978, Ser. No. 880,963

Int. Cl.[2] G09B *29/00*

U.S. Cl. 35—7 R **1 Claim**



1. A metric conversion board, comprising

a wooden board of substantially square shape with a substantially planar face, a top edge, a bottom edge substantially parallel to the top edge and a pair of spaced parallel side edges, said board having a projecting part extending substantially vertically from the top edge and coplanarly with the board equidistantly spaced from the side edges and substantially parallel thereto, said top edge having a pair of arcuate indentations formed therein, each extending from the projecting part to a corresponding one of the side edges and said projecting part having a free end spaced from said top edge and having a bore formed therethrough for facilitating hanging of the board on a substantially vertical supporting surface, said board having a pair of grooves formed in its face parallel to the side edges and each adjacent corresponding ones of said side edges;

an English to metric conversion chart on the face of the board between the grooves;

a Fahrenheit thermometer mounted in one of the grooves;

a Celsius thermometer mounted in the other of the grooves; and

a sheet of transparent plastic covering the face of the board and the grooves.

4,152,846

FLIGHT TRAINING METHOD AND APPARATUS

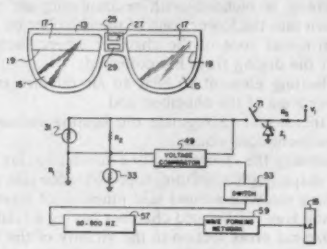
Frank A. Witt, Rt. #4 Hidden Acres, Lexington, S.C. 29072

Continuation-in-part of Ser. No. 659,906, Feb. 20, 1976, Pat. No. 4,021,395. This application Feb. 15, 1977, Ser. No. 768,851

The portion of the term of this patent subsequent to May 10, 1994, has been disclaimed.

Int. Cl.[2] G09B *09/08*

U.S. Cl. 35—12 B **18 Claims**



5. A method of limiting the vision of a pilot to the instrument control panel of his aircraft using a lens means switchable to a first state of transparency permitting visual communication therethrough for permitting the pilot to view the control panel of the aircraft and switchable to a second state of opacity for blocking visual communication when the pilot's head is in a position to permit viewing outside the aircraft through the windshield, comrpising the steps of:

positioning said lens means in a transverse relationship with respect to the line of sight of a pilot;

checking the pilot's vision through said lens means with respect to a peripheral-view-direction to a predetermined line of sight to engage movement of the pilot's head for a greater peripheral viewing along said peripheral-view-direction;

monitoring the relative position of said predetermined line of sight with respect to the instrument control panel and the windshield, said monitoring including indicating when said predetermined line of sight passes through said windshield; and

switching said lens means to said first or second state responsive to said monitoring.

17. Flight training apparatus for preventing the pilot from viewing out through the windshield of his aircraft, comprising:

voltage controlled lens means having a first state of transparency permitting the wearer to visually communicate therethrough, and operable to a second state of opacity for locking visual communication;

means for suitably securing said lens means in a transverse relationship with respect to the line of sight of a pilot;

vision checking means for checking the pilot's vision through said lens means with respect to a peripheral-view-direction to a predetermined line of sight to engage movement of the pilot's head for a greater peripheral viewing along said peripheral-view-direction;

means for monitoring the relative position of said predetermined line of sight with respect to the windshield, said means indicating when said predetermined line of sight passes through said windshield, said monitoring means includes means for producing a voltage level indicating said predetermined line of sight passing through said windshield; and

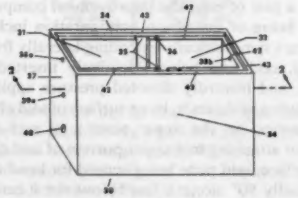
electrical circuitry means cooperable with said monitoring means for actuating said lens means to said second state responsive to said production of said voltage level indicating said predetermined line of sight passing through said windshield, said lens means otherwise remaining in said first state.

4,152,847

METHOD AND DEVICE FOR TEACHING THE COMPARATIVE MEASUREMENT OF HEAT FLOW

Carl H. Pfeiffer, 1355 Hommen Rd., Rte. 1, Deerfield, Wis. 53531

Filed Jan. 13, 1978, Ser. No. 869,048
Int. Cl.² G09B *23/16*
U.S. Cl. 35—19 R **23 Claims**



1. A teaching device for the comparative measurement of heat flow, comprising an open-topped container constructed of relatively low heat conductive material having means for locating an internal partition, at least one partition of selected heat conductivity engageable with the partition locating means in removable relation to divide the container into a variable chamber and a substantially identical control chamber, means for measuring the temperature within each of the identical chambers, and cover means for selectively closing the chambers whereby the device may be used to selectively measure heat flow into and between the identical chambers.

4,152,848

LIFE SUPPORT TRAINING DEVICE

Joseph C. Trinkwalder, North Tonawanda, N.Y., assignor to Sherwood-Selpac Corporation, Lockport, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,592
Int. Cl.² B63C *11/12*
U.S. Cl. 35—29 B **5 Claims**

1. A life support system for training users of compressed breathing air apparatus, said system comprising:

a relatively large tank adapted to confine compressed breathing air in an amount sufficient to sustain a user thereof for a substantial period of time,

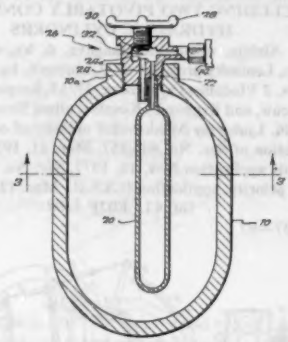
a relatively small tank adapted to confine compressed breathing air in an amount sufficient to sustain a user thereof for only a pre-determined, limited duration of time in comparison to said large tank,

means connecting said large and small tanks together in fluid communication with one another,

a charging valve means being operatively disposed between said large and small tanks for selectively controlling the fluid communication therebetween so that said small tank can be selectively charged with breathing air from said large tank and thereafter used independently of said large tank,

a pressure regulator means in fluid communication with at least said small tank, said pressure regulator means controlling the pressure of breathing air supplied to a user of said life support system from said small tank, and

warning means in fluid communication with at least said



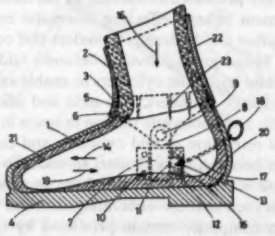
small tank for monitoring the pressure therein so that when the pressure in said small tank falls to a pre-determined level, a user of said life support system will be warned of such pressure level condition whereby a user being trained with respect to the operation of said compressed breathing air apparatus may experience the operation of said warning means within a relatively shorter period of time through use of only said small tank than if said large tank were used for training purposes.

4,152,849

SKI BOOT

Jean-Paul Frechin, Chamonix, and Andrea Gabrielli, Cluses, both of France, assignors to The Garcia Corporation, Teaneck, N.J.

Filed Jul. 12, 1977, Ser. No. 815,053
Claims priority, application France, Jul. 19, 1976, 76 22463
Int. Cl.² A43B *5/04, 3/00*
U.S. Cl. 36—120 **8 Claims**



1. An athletic boot comprising:

a sole and integral lower foot encasing shell;

a generally cylindrical uninterrupted upper shell constructed to form an ankle and lower leg encircling portion, said shells having conical overlapping edges;

a downwardly extending slide element pivotally mounted on each side of the lower edge of said upper;

a guide mounted to each side of said lower, said guides being constructed and arranged to vertically receive said slides; and

locking means associated with each of said slides and guides arranged to secure said slides in said guides and said upper

and lower in mating fashion but to permit intentional release of said sides from said guides and vertical displacement of said upper in relation to said lower whereby said boot can be put on and removed.

4,152,850

BUCKET-WHEEL TRENCH EXCAVATOR HAVING A FOUR-ELEMENT ARTICULATED LINKAGE INCLUDING TWO PIVOTABLY CONNECTED HYDRAULIC CYLINDERS

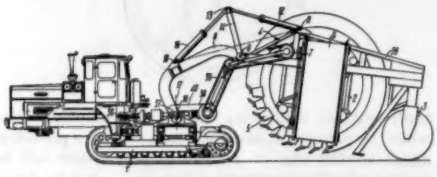
Mark Z. Alshits, ulitsa Vakhtangova, 6, kv. 44; Anatoly A. Kalugin, Leninsky prospekt 60/2, korpus 6, kv. 77; Gennady I. Sokolov, 2 Vladimirskaya ulitsa, 47/13, korpus 2, kv. 203, all of Moscow, and Evgeny P. Kovalev, ulitsa Stroitelei, 2, korpus 3, kv. 86, Ljubertsy Moskovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 666,157, Mar. 11, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,702

Claims priority, application U.S.S.R., Mar. 12, 1975, 2117698

Int. Cl.[2] E02F *5/08*

U.S. Cl. 37—97 **5 Claims**



1. A bucket-wheel trench excavator comprising: a prime mover; a bucket-wheel excavating unit arranged to bear on a wheeled support, a prime mover frame and an excavating unit frame; an intermediate frame connected to said prime mover frame and said excavating unit frame; front and rear horizontal-pivoted joints respectively connecting said intermediate frame to said primer mover frame and said excavating unit frame; two hydraulic cylinders respectively articulated to said intermediate frame and to said excavating unit frame to transfer said excavating unit between a working position and a transport position by turning said intermediate frame about said front and rear horizontal-pivoted joints; a four-element articulated linkage formed by the frames and the hydraulic cylinders in which linkage said intermediate frame and said excavating unit frame are rigid members and said two hydraulic cylinders are pivotably connected in succession; a strut in said four-element linkage effecting kinematic connection between said frames and hydraulic cylinders and connecting the four-element likage joints provided between said rigid frames and between said hydraulic cylinders to enable said rigid members, said hydraulic members, said strut and said joints all to undergo simple and composite motion in space in the course of extension and retraction of said cylinders and cause the point of connection between the cylinders to undergo conjoint pivotal movement with respect to said front and rear horizontal-pivoted joints such that the excavating unit and wheeled support undergo composite motion produced by the composite movement of the joint of connection between the cylinders and the pivot movement of said rear joint in conjunction with the length change of said cylinders to produce substantial movement of said excavating unit towards said prime mover frame in going from said working position to said transport position; a vertical-pivot joint on said prime mover frame to enable said excavating unit and said intermediate frame to turn in relation to the prime mover, said vertical-pivot joint comprising a flat turntable having a rotatable disk and a crossmember mounted on said turntable and connected by said horizontal-pivoted joints to said intermediate frame such that said intermediate frame is pivotably movable around said horizontal-pivoted joints.

4,152,851

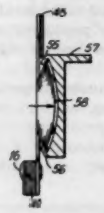
STRESS RESISTANT SUPERMARKET DISPENSER FOR INFORMATIONAL SHEETS

Sol Goldstein, 18 Falcon Rd., East Hills, L. I., N.Y. 12123

Continuation-in-part of Ser. No. 834,161, Sep. 19, 1977, abandoned. This application Mar. 23, 1978, Ser. No. 889,493

Int. Cl.[2] G09F *1/00*

U.S. Cl. 40—10 R **1 Claim**



1. In assemblage of items for presentation for dispensation in serial fashion, the assemblage including

a plurality of informational sheetlike items,

means for supporting said items selectively from an indicia bearing channel mounted upon an edge of a shelf or wall frame, said channel having top and bottom flanges,

said support means including a flat support plate of flexible synthetic resinous material including a head and base section, a pair of ears, the improvement comprising:

said plate being of cruciform configuration including said pair of ears symmetrically extending laterally from a vertical strip, said ears being selectively inserted into said channel, and inwardly directed pressure applied to said ears securing said ears to inner surface of said channel; and

adhesive means on the upper portion of said supporting means for attaching said upper portion of said dispenser to a flat surface, said plate being scored for bending through substantially 90° along a line below the location of said adhesive means.

4,152,852

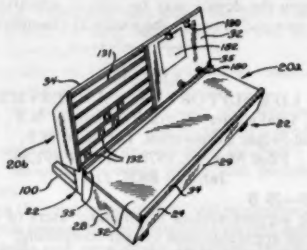
TRANSPARENCY VIEWER ASSEMBLY

Donald J. Brown, Naperville, Ill., assignor to Knox Manufacturing Co., Wood Dale, Ill.

Filed Jan. 12, 1978, Ser. No. 868,984

Int. Cl.[2] G02B *27/02*

U.S. Cl. 40—361 **8 Claims**



1. In combination with a transparency viewer having a housing with a translucent top surface, illuminating means within the housing and a pair of spaced leg assemblies extending from the bottom surface of said housing, a pair of supporting frame assemblies for supporting a pair of said viewers, each supporting frame assembly comprising: a base frame portion adapted to be positioned on and supported by a supporting surface, said base frame portion having an open channel facing upwardly of a size at least as great as that of the leg assembly of a first viewer; first means for releasably securing the leg

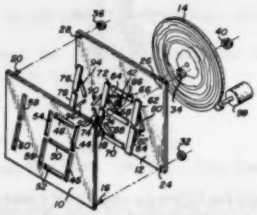
assembly of said first viewer to said base frame portion when said leg assembly is inserted into said channel of said base frame portion; a generally upright frame portion connected to said base frame portion rearward of said channel of said base frame portion, extending upwardly from said base frame portion and having an open channel facing forwardly of a size at least as great as that of the leg assembly of a second viewer; and second means for releasably securing the leg assembly of said second viewer to said upright frame portion when the leg assembly is inserted into said channel of said upright frame portion.

4,152,853

MULTIPLE SHUTTER DIGITAL DEVICE

Robert L. Lewis, 393 E. McKinley, Sunnyvale, Calif. 94086

Filed Oct. 11, 1977, Ser. No. 840,580
Int. Cl.[2] G09F *9/30*
U.S. Cl. 40—451 **10 Claims**



1. A multiple shutter digital display device comprising:
an opaque face plate having a patterned plurality of transparent segment windows provided therein;
a shutter support plate facing and disposed in proximal alignment behind said face plate;
a plurality of shutters, each of which is uniquely associated with one of said segment windows and is large enough to completely cover the associated window when aligned therewith, said shutters being disposed between said shutter support plate and said face plate;
a rotary cam having a plurality of concentric, substantially circular, grooved tracks formed upon a first surface, each of said tracks having portions about its circumference which vary in diameter, said cam being disposed in proximal facing alignment behind said support plate;
a plurality of cam follower arms, each of which are associated with one of said shutters, a first end of each of said arms being pivotally attached to a midlength edge of said associated shutter, a midportion of said arm being pivotally attached to said shutter support plate and a second end of said cam follower arm being provided with a track following pin extending through an aperture in said support plate to engage one of said tracks in said cam shutter actuator whereby said pins each follow one of said tracks as said cam is rotated, and the motion of said pin is transferred through the follower arm to open and close the associated shutter and thereby present a digital display to a viewer.

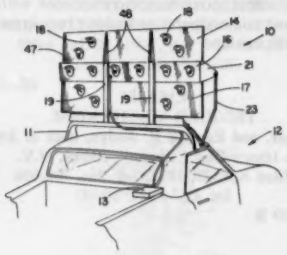
4,152,854

FOLDABLE SAFETY SIGN

Bernie B. Berry, Jr., and Myron F. Melvin, both of Indianapolis, Ind., assignors to Inland Industries Inc., Indianapolis, Ind.

Filed Oct. 26, 1977, Ser. No. 845,641
Int. Cl.[2] G09F *15/00*
U.S. Cl. 40—610 **5 Claims**

1. A vehicle mounted sign structure of the sequentially illuminated safety arrow type, said sign structure comprising a base support member adapted to be secured to the roof of a vehicle and extending across and spaced above the vehicle, three plates of rectangular configuration which, in erected position, are disposed in horizontal edge-to-edge configuration to form a flat sign face, each of said plates carrying its portion of the sequentially energized lights making up the illuminated safety arrow, the horizontal contiguous margins of the plates being joined by hinges, spaced upright braces extending between said support member and the central one of said plates, triangularly shaped members extending from the ends of said central plate outwardly from the sign face in the direction of



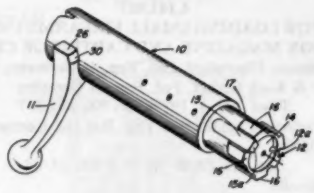
motion of the vehicle, the plates above and below said central plate being movable on their respective hinges to folded position in which they extend outwardly from the plane of said central plate in the direction of motion of the vehicle, the inclined margins of said triangularly shaped members defining said folded position of said upper and lower plates, whereby in folded position said sign structure presents a triangular prism configuration with the apex leading in the direction of motion of the vehicle.

4,152,855

RIFLE BOLT LOCKING APPARATUS

Joseph T. DuBiel, 1724 Baker Rd., Sherman, Tex. 75090, and John P. Tyson, 105 Memorial Dr., Denison, Tex. 75020

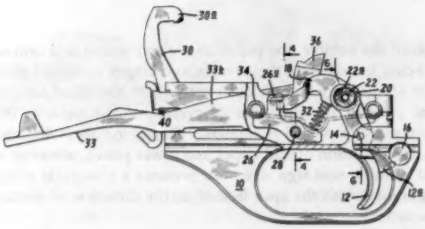
Continuation of Ser. No. 709,397, Jul. 28, 1976, abandoned. This application Mar. 28, 1978, Ser. No. 891,048
Int. Cl.[2] F41C *11/06*
U.S. Cl. 42—16 **2 Claims**



1. In a manually cocked firearm having a substantially cylindrical bolt and a cooperating receiver in which said bolt is rotatable and longitudinally slidable between a forward firing position and a rearward cocked position, a locking apparatus for locking said bolt in said forward firing position, comprising:
five circumferentially aligned solid locking lugs of equal longitudinal length integral with said bolt and equally spaced about the outer surface of said bolt contiguous with the forward end thereof, the circumferential width of each of said lugs being substantially thirty-six degrees,
five circumferentially aligned cooperating locking lugs of equal longitudinal length equally spaced about the inner surface of said cooperating receiver adjacent the forward end thereof, the circumferential width of each of said cooperating lugs being substantially thirty-six degrees, the circumferentially aligned forward ends of said cooperating locking lugs being positioned rearwardly of the for-

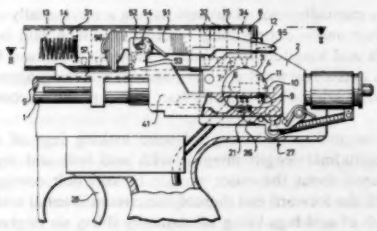
ward end of said receiver a distance at least equal to the longitudinal length of said locking lugs on said bolt, and, a bolt handle positioned rearwardly on said bolt for manual manipulation of said bolt between a forward firing position in which respective ones of said locking lugs are positioned forwardly of and in aligned abutment with respective ones of said cooperating locking lugs, and a rearward cocked position achieved by rotation of said bolt substantially thirty-six degrees relative to said receiver and longitudinal movement therebetween with said locking lugs and said cooperating locking lugs in interdigitated sliding relationship.

4,152,856
TRIGGER MECHANISM
James Tollinger, and Edward P. Joslyn, both of Ithaca, N.Y., assignors to Ithaca Gun Company, Ithaca, N.Y.
Filed Apr. 25, 1977, Ser. No. 790,604
Int. Cl.[2] F41C *19/00*
U.S. Cl. 42—69 B **5 Claims**



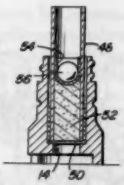
5. A trigger mechanism for firearms comprising a hammer, a sear adapted to hold the hammer in a cocked position, a trigger, a trigger bar adapted to engage and drive the sear away from the hammer, and coupling means secured to the trigger bar for engaging the trigger at any of a plurality of spaced locations to vary the displacement of the trigger bar with respect to the sear.

4,152,857
MEANS FOR LOADING SMALL FIREARMS INCLUDING A BOX MAGAZINE AND CARTRIDGE CLIPS
Dieter Ketterer, Oberndorf, Fed. Rep. of Germany, assignor to Heckler & Koch GmbH, Fed. Rep. of Germany
Filed Jun. 1, 1977, Ser. No. 802,587
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1976, 2630659
Int. Cl.[2] F42B *39/06;* **F41C** *25/02*
U.S. Cl. 42—88 **22 Claims**



1. A system for loading a hand gun with cartridges comprising a magazine for feeding said cartridges in association with said gun, said magazine having an elongated body defining a channel for receiving and storing a plurality of said cartridges in side by side arrangement, said channel being open at one end for the insertion of said cartridges and having barrier means at said one end facilitating entrance of and preventing removal of said cartridges, and spring means for normally biasing said cartridges within said magazine against said barrier means, a clip comprising a handle and a pair of tongues resiliently secured at one end to said handle extending outwardly therefrom to embrace and hold a plurality of cartridges in side by side arrangement, said magazine body having a pair of opposed recesses running longitudinally of said channel for receiving said tongues to thereby permit insertion and removal of said clip from said channel.

4,152,858
FAST LOADER FOR MUZZLE-LOADER
Harold L. Dobbs, 413 Goodreau Ln., Glide, Oreg. 97443
Filed Aug. 16, 1977, Ser. No. 825,152
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—90 **10 Claims**



1. A hand tool for forming a charge for a muzzle-loading gun and including a predetermined amount of powder and a bullet at least partially embraced within a patch, said tool including a tubular body defining a first bore extending longitudinally therethrough and including a diametrically enlarged counterbore opening outwardly of one end of said body, the interior of said body defining a shoulder facing outwardly of said one end at the inner end of said counterbore, a sleeve of larger outside diameter than the diameter of said first bore and having one end loosely removably telescoped into said counterbore from said one end of said body and defining a second bore extending therethrough of substantially the same diameter as said first bore, said second bore being of a diameter adapted to snugly and slidably receive a bullet of a predetermined size therein at least partially embraced within a patch, and the outside diameter of said sleeve being smaller than the diameter of said counterbore by an amount enabling a thin, frangible and flexible disk of a larger plan area than said counterbore to extend across said one end of said sleeve telescoped into said counterbore with the peripheral portions of said disk clamped between the outer surfaces of said one end of said sleeve and the opposing surfaces of said counterbore adjacent the inner end thereof.

4,152,859
FISHING LURE RETRIEVER
Nils B. Hansen, R.D. #1, Marietta, N.Y. 13110
Filed Dec. 20, 1977, Ser. No. 862,546
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—17.2 **9 Claims**

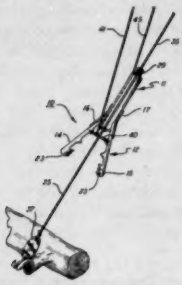
1. Apparatus for recovering a fishing lure and line which is snagged or fouled in relatively deep water including

an elongated body having means operatively associated therewith for slidably receiving a snagged fishing line therein, said body possessing sufficient weight whereby it is capable of sliding down the line toward a lure affixed thereto under the influence of gravity,

a pair of cooperating jaw members, the proximal end of which are mounted at the front end of said body with the jaws extending outwardly therefrom in a generally axial direction, said jaws having teeth formed in the distal end thereof being arranged to move between an open position for receiving a lure therebetween and a closed position for capturing said lure therebetween,

a spring loaded hinge for securing each jaw member to the body and for biasing the jaws into a closed position,

a trigger means having a pin extending between the jaws for holding the jaws in an open position and an actuator for



removing the pin whereby the jaws are allowed to close, and

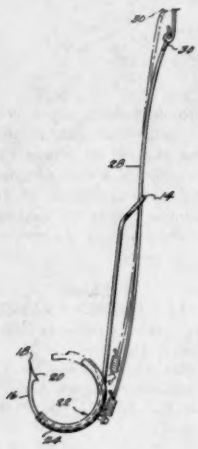
recovery means for raising the body, and thus the jaws secured thereto, to the surface.

4,152,860

FISHHOOKS

Samuel Leonardi, 809 N W. 7th Terr., Fort Lauderdale, Fla. 33311

Filed Dec. 22, 1977, Ser. No. 872,110
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—37 **8 Claims**



1. A fishhook comprising:

a U-shaped shank having arms of unequal length, the longer arm forming a stem;

C-shaped spear means having first portion shaped similarly to the curved portion of said shank, said first portion being slidably attached to said curved portion, and having a second portion not attached to said shank so that when said first portion slides toward the shorted arm of said shank, the tip of said second portion moves away from the tip of said shorter arm, and when said first portion slides away from said shorter arm, said second portion tip moves toward said shorter arm tip; and

means for energizing said C-shaped spear means solely by the movement of a fish with respect to said fishhook and an attached fishing line so that when a fish becomes caught on said shorter arm in a conventional manner, the movement of said fish with respect to said fishhook and an attached fishing line causes said second portion to move toward said shorter arm tip and enter said fish in a location different from the location said shorter arm entered said fish, thereby increasing the chances of the capture thereof.

4,152,861

ANIMAL TRAP HOLDER

Wesley T. Miller, 925 Sheridan, Ypsilanti, Mich. 48197

Filed Jul. 27, 1977, Ser. No. 819,253
Int. Cl.[2] A01M *23/26*
U.S. Cl. 43—88 **10 Claims**

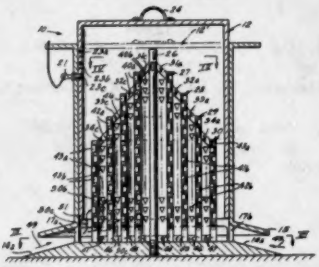
1. In combination, a trap including a pair of spring biased jaws held in spaced relationship when the trap is set and initially moving away from each other upon the trap being released, a holder body, and trap jaw engaging means defined on said body adapted to receive and hold the associated trap jaws for support of the trap, said means supporting the trap when set and releasing the associated jaws when the trap is sprung.

4,152,862

COCKROACH EXTERMINATION APPARATUS

Mohammed S. Mohiuddin, 920 W. Lakeside, Apt. 1511, Chicago, Ill. 60640

Filed Feb. 2, 1978, Ser. No. 874,472
Int. Cl.[2] A01M *1/10*
U.S. Cl. 43—121 **13 Claims**



1. An insect extermination apparatus, comprising:

(a) enclosure means comprising an outer enclosure having an open end through which is received an inner enclosure providing a dark interior space and entrance means in the outer enclosure for receiving insects to be exterminated;

(b) a core means removably attached to the outer enclosure and positioned within the outer enclosure for retaining insects which crawl into the enclosure means; and

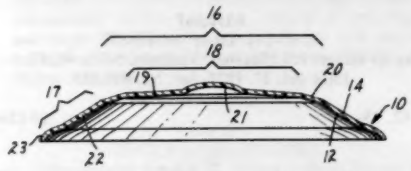
(c) closure means for selectively closing the entrance means comprising selective movement of the inner enclosure to block the entrance means.

4,152,863

POPPER TOY

James F. Kubiatowicz, Minneapolis, Minn., assignor to Custom Concepts, Incorporated, Minneapolis, Minn.

Filed Jan. 12, 1977, Ser. No. 758,787
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—1 R 10 Claims



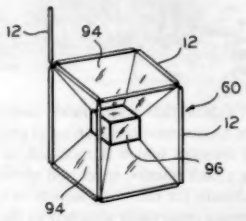
1. A popper toy comprising a thin wall of flexible resilient polymeric material normally having a generally concave inner surface and a generally convex outer surface and comprising concentric edge connected wall portions including a central wall portion, a first hollow truncated conical shaped wall portion having opposite surfaces disposed at a first included angle around said central wall portion, a second hollow truncated conical shaped wall portion disposed around said first truncated conical shaped wall portion having opposite surfaces disposed at a second included angle substantially smaller than said first included angle, and a rim having an arcuate cross section around said second truncated conical shaped wall portion, said central wall portion and first truncated conical shaped wall portion being disposed to bend said wall at the juncture between said truncated conical shaped wall portions and flex to change the outer surface of said central portion from convex to concave in response to moderate thumb pressure applied generally centrally on said outer surface, and to cause snap action recovery of said central portion to return the outer surface from concave to convex a short time after removal of said thumb pressure to afford propulsion of said popper toy into the air, said rim and second hollow truncated conical shaped wall portion being disposed to provide a generally rigid support structure around said first hollow truncated conical shaped wall portion which support structure is adapted for engagement along opposite edges of said rim by the thumb and index finger during application of thumb pressure to said central portion and to restrict deflection and transverse bending upon application of finger pressure to said popper toy.

4,152,864

DEVICE FOR FORMING BUBBLES FROM PLANAR FILM SHAPES

Victor J. Habisohn, 252 Englewood Rd., Hoffman Estates, Ill. 60195

Filed Jul. 12, 1976, Ser. No. 704,347
Int. Cl.[2] A63H *33/28, 33/12*
U.S. Cl. 46—6 6 Claims



1. A device for producing thin film shapes and forms comprising:

film producing liquid;

means for forming polyhedral bubble shapes including a skeletal confuguration for inserting into said liquid, said skeletal configuration including a plurality of rods, each of said rods including a first pair of openings on one end and a second pair of openings on the opposite end;

means for coacting with said openings to connect either of said ends of one said rod with two other said ends of any two other said rods and comprising joint members, each of said joint members having but two ends, said ends of each of said joint members being insertable in said openings for securing two of said rods together, said skeletal configuration being shaped to suspend said liquid in thin film planar shapes wherein one said planar shape is supported by other said planar shapes, which are, in turn, supported by said skeletal configuration; and

inflating means for producing a three dimensional film form from said liquid, determined by the shape of said skeletal configuration and said one thin film shape.

4,152,865

GREETING CARD WITH HOLDING TOY

Seito Ikeda, 1050A, Ninth Ave., Honolulu, Hi. 96816

Filed Dec. 27, 1977, Ser. No. 864,858
Int. Cl.[2] A63H *3/10*
U.S. Cl. 46—116 8 Claims

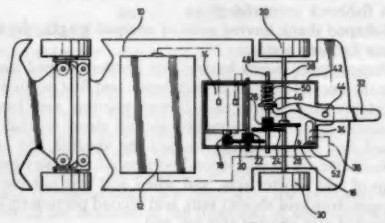
1. A greeting card and holding toy combination comprising a greeting card having decorative indicia thereupon and forming a cut out portion adjacent the indicia, a holding toy having movable limbs operable by a spring-loaded mechanism and arranged within the cut out portion of the card to form a portion of the decorative indicia, the holding toy being removable from the card and employable separately therefrom.

4,152,866

ELECTRICALLY DRIVEN TRAVELLING TOY

Kataro Suda, Tokyo, Japan, assignor to Suda Kinzoku Seisakusho Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,675
Claims priority, application Japan, Aug. 17, 1976, 51-110172
Int. Cl.[2] A63H *17/00, 33/26*
U.S. Cl. 46—251 4 Claims



1. An electrically driven toy comprising a frame, having wheels rotatably carried thereon, an electric motor, an electric circuit for operating said motor, a selectively engagable gear

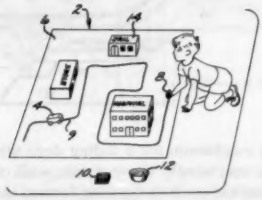
transmission connecting said motor and said wheels and a control lever electrically interposed in said electric circuit and mechanically interposed in said gear transmission, said control lever being arranged to selectively operate said toy in a running mode by simultaneously engaging said gear transmission and completing said electric circuit and in an idling mode by simultaneously disengaging said gear transmission and opening said electric circuit.

4,152,867

CONTROLLED TOY VEHICLE ASSEMBLY

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1978, Ser. No. 870,940
Int. Cl.[2] A63H *17/36*
U.S. Cl. 46—259 **31 Claims**



1. A vehicle capable of locomotion and more particularly controlled locomotion in response to variations in frictional resistances along a support surface, comprising;

a base member;

a first driving member assembly operatively connected to the base member for rotation about a first axis, and

a second pair of driving members operatively connected to the base member and rotating respectively about a second and third axis that are each nonparallel to the first axis of the first driving member, whereby the first driving member can propel the vehicle and the second pair of driving members can principally control the direction of movement in response to variations in frictional resistance along the surface that contacts one of the second pair of driving members.

4,152,868

METHOD OF PRODUCING MUSHROOM SPAWN

Richard G. Lincoln, 6820 Kallin Way, Long Beach, Calif. 90815

Filed Feb. 24, 1978, Ser. No. 880,770
Int. Cl.[2] A01G *1/04*
U.S. Cl. 47—1.1 **3 Claims**

1. An improved method of growing mushroom spawn in a plurality of growth chambers, with each of said chambers having a removable cover that is vented to the ambient atmosphere through a filter, said method including the steps of:

a. providing a clean enclosure substantially free of micro organisms;

b. providing a source of a gaseous fumigant;

c. subjecting a quantity of a mushroom mycelium growth nutrient to said fumigant to sterilize said nutrient;

d. providing a quantity of sterile water in said clean enclosure;

e. transporting said sterile nutrient to said clean enclosure and mixing the same with a quantity of sterile water;

f. heating the mixture of sterile water and sterile nutrient in said clean room to cook the nutrient;

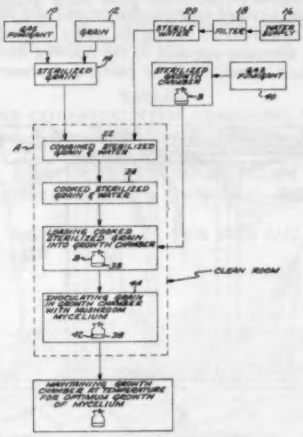
g. sequentially sterilizing said growth chambers and covers and disposing said growth chambers and covers in said clean room;

h. partially filling said growth chambers in said clean room with said heated nutrient after the latter has cooled to ambient temperature;

i. inoculating said nutrient in said clean room in said growth chambers with mushroom mycelium of a desired species;

j. placing said covers in sealed positions on said growth chambers after said inoculation;

k. transporting said growth chambers with covers thereon to an area that is maintained at a temperature and environmental condition favorable to optimum growth of said



mycelium, with said vented openings allowing escape of gases from said growth chambers, but said filters preventing the entry of micro organisms from the ambient atmosphere into the interior of said growth chambers; and

l. allowing said mycelium to grow in said nutrient in said growth chambers until the spawn has grown through said nutrient and occupies a substantial part thereof.

4,152,869

PROPAGATING WOODY PLANT MATERIAL

Owen P. Jones, Maidstone, England, assignor to National Seed Development Organisation Limited, Newton and The Kent Incorporated Society for Promoting Experiments in Horticulture, Maidstone, both of, England

Filed Jul. 14, 1977, Ser. No. 815,680
Claims priority, application United Kingdom, Jul. 16, 1976, 29730/76
Int. Cl.[2] A01G *1/00*
U.S. Cl. 47—58 **10 Claims**

1. A process for propagating woody plant material of apple, plum, or cherry in vitro which includes setting a shoot on a nutrient medium including a cytokinin, an auxin and phloridzin to produce a number of shoots, excising individual shoots and rooting these on the same or a similar nutrient medium but from which the cytokinin is omitted, and finally growing the resulting plants on.

4,152,870

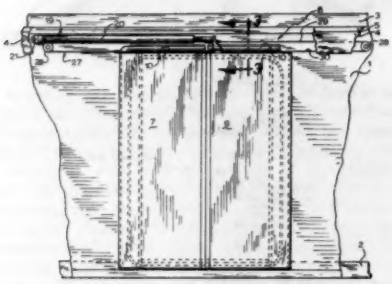
SLIDABLE DOOR CLOSURE AND HANGER SYSTEM FOR PASSENGER VEHICLE

Joseph Knap, Montreal, Canada, assignor to Canadair Limited, Montreal, Canada

Filed Mar. 27, 1978, Ser. No. 890,314
Claims priority, application Canada, Jan. 13, 1978, 294920
Int. Cl.[2] E05F *17/00*
U.S. Cl. 49—118 **6 Claims**

1. A slidable door closure and hanger system adapted to displace a sliding door along a wall in a path extending transversely relative to a door aperture in the wall, said slidable door closure and hanger system comprising an elongated slidable door closure and an elongated slidable door hanger each

extending longitudinally of said path wholly above said door aperture, said slidable door closure including a fluid actuated cylinder unit extending longitudinally along said path and including a cylinder, a piston slidable in said cylinder, and a piston rod attached to said piston and slidable through one end of the cylinder, one of said cylinder and piston rod being connected to said wall, the other of said cylinder and piston rod being connected to said door and bodily displaceable therewith, and a return spring coiled around said piston rod in said cylinder, operatively biasing the piston rod and said door in a closing direction opposite to the opening direction produced by fluid actuation of the piston and constructed and



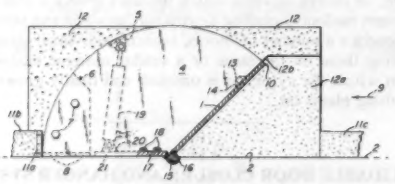
arranged for reduced closure force in the spring at the end of the closing operation and unhurting impact by the closure force, said slidable door hanger comprising a slide track unit including a stationary track member, a movable door carrier track member, a movable intermediate track member, and bearing balls operatively mounted and retained between said movable intermediate track member and said stationary and said movable track members respectively, said stationary track member being fixedly secured relative to said wall above said door aperture and extending longitudinally along said door substantially co-extensive with the width of the door aperture covered by said door.

4,152,871

VEHICLE BARRICADE

William E. Kardash, Jr., Bryans Road, Md., assignor to The United States of America as represented by the Attorney General, Washington, D.C.

Filed Mar. 15, 1978, Ser. No. 886,869
Int. Cl.[2] E01F *13/00*
U.S. Cl. 49—49 **7 Claims**



1. A vehicle barricade comprising:

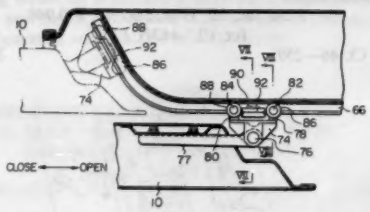
A pivotally mounted barrier plate which can be raised or lowered about a pivot, at least one sector mounted near the end of said barrier plate, said sector having one edge thereof fixed to said barrier plate and extending rearwardly therefrom in an arc of approximately 135° so that said barrier plate is elevated at approximately 45° when raised, said sector having a counterweight fixed thereto so that said barrier plate remains raised or lowered unaided, and said counterweight located on said sector on the end of the arc opposite said barrier plate so that said sector and said barrier plate are balanced when said barrier plate is raised to approximately 22.5°.

4,152,872

SLIDING MECHANISM FOR VEHICLE SLIDING DOOR

Hiroyuki Tanizaki, Yokohama, and Michio Shinada, Nagoya, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 10, 1978, Ser. No. 868,295
Claims priority, application Japan, Jan. 12, 1977, 52-2046
Int. Cl.[2] E05D *15/10*
U.S. Cl. 49—214 **9 Claims**



1. A sliding mechanism for a sliding door which is slidable forwardly and rearwardly along a side wall of a vehicle to selectively close and open an opening formed in said side wall, said sliding mechanism comprising:

first guide track means attached to said side wall of said vehicle so as to be substantially horizontal with respect to the chassis of said vehicle and curved at a position near said opening toward the inside of said vehicle, said first guide track means being formed with an elongate ridge portion which projects upwardly and longitudinally extends throughout said first guide track means;

second guide track means attached to the side wall of said vehicle at a position near said first guide track so as to be substantially horizontal with respect to the chassis of said vehicle and parallel to said first guide track means, said second guide track means being formed with a vertical surfce which extends parallelly to said elongate ridge portion;

a support member pivotally connected to an end of said door;

at least one vertical roller rotatably connected to said support member in such a manner that an axis of said vertical roller is substantially horizontal with respect to the chassis of said vehicle when said support member takes a postion with a predetermined angle with respect to the inside surface of said door, said vertical roller being formed at its peripheral wall section with an annular groove; and

at least one horizontal roller rotatably connected to said support member in such a manner that an axis of said horizontal roller is substantially perpendicular with respect to said chassis, the axes of said vertical and horizontal rollers being perpendicular with each other,

the assemblage of said door with the side wall of said vehicle being such that said vertical roller rolls on said elongate ridge of said first guide track means receiving in the annular groove thereof said ridge portion and said horizontal roller rollably contacts at its cylindrical outer surface with said vertical surface of said second guide track means,

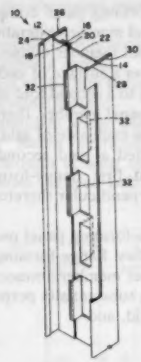
the distance between said ridge portion of said first guide track means and the vertical surface of said second guide track means at a position where said ridge portion and said vertical surface are curved toward the inside of said vehicle being smaller than the distance between same along non-curved portions so that the axis of said vertical roller is always perpendicular to said ridge portion of said first guide track means irrespective of positions of said door with respect to the side wall of said vehicle.

4,152,873

BONDED TWO PIECE METAL STUD

William R. Burke, Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Sep. 14, 1977, Ser. No. 833,099
Int. Cl.[2] E04H *9/00*
U.S. Cl. 52—1 **5 Claims**



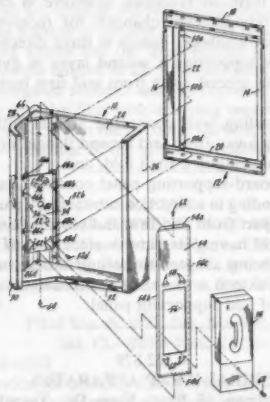
1. A formed, elongate, sheet metal stud having an elongate central web, said web adjoining board supporting means along one elongate web edge with means along the opposite web edge for supporting spaced parallel board for forming a hollow wall, characterized by said stud being formed of two elongate sections which are adhered together in said web along overlapping portions of said two sections, said sections being adhered together by a heat softenable adhesive, wherein said heat softenable adhesive is a hot-melt polymeric adhesive.

4,152,874

TELEPHONE BOOTH MOUNTING ARRANGEMENT

Edward S. Ertl, McHenry, Ill., assignor to Acoustics Development Corporation, Northbrook, Ill.

Filed Feb. 10, 1978, Ser. No. 876,756
Int. Cl.[2] E04F *19/00*
U.S. Cl. 52—27 **7 Claims**



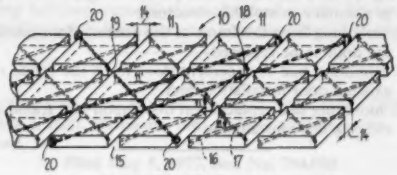
1. A telephone booth construction including a telephone booth having wall means, a telephone mounting bracket having a group of mounting holes therein, screw means using selected ones of said mounting holes for attaching said mounting bracket in a first position to said wall means or using other selected ones of said mounting holes for attaching said mounting bracket in a second position to said wall means, said mounting bracket being substantially shorter than the wall means to which it is attached, a telephone mounting cover having an opening therein and two sets of telephone mounting holes adjacent said opening, said mounting cover extending generally between the top and bottom of said booth, and screw means for mounting a telephone and said mounting cover to said mounting bracket, one set of cover mounting holes being used to attach the telephone and cover in a first position corresponding with said bracket first position and the other set of cover mounting holes being used, with a reversal of cover position, to mount the telephone and said cover in a second position on said mounting bracket.

4,152,875

GROUND COVERING WITH ADJOINING PLATES

Bruno Soland, Wiesengrundstrasse 20, 8942 Oberrieden, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,478
Claims priority, application Switzerland, Dec. 1, 1976, 15115/76
Int. Cl.[2] E01C *5/16, 9/08;* **E02B** *3/12*
U.S. Cl. 52—227 **11 Claims**



1. A ground covering comprising:
a number of adjoining plates;
tensioning elements for interconnecting the plates with one another;
said tensioning elements extending essentially parallel to the plates and through said plates;
positive locking elements for interconnecting neighboring plates with one another with a spacing therebetween, said positive locking elements being effective between neighboring plates in a direction transverse to a plane containing the plates;
said positive locking elements comprising spacer holders having arched impact surfaces;
each of said plates having narrow sides provided with sockets for receiving said impact surfaces; and
the width of each spacer holder, measured parallel to the plane of the plates, being less than the spacing between the plates;
whereby all spacer holders which engage at such plates may be turned out of the sockets and removed therefrom.

4,152,876

METHOD OF MAKING AND INSTALLING TRIMMABLE INSULATED STEEL FACED ENTRY DOOR

James R. Seely, Troy, Mich., assignor to The Stanley Works, New Britain, Conn.

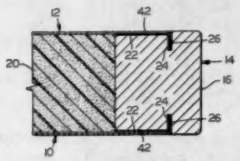
Filed Feb. 14, 1978, Ser. No. 877,709
Int. Cl.[2] E06B *3/36*
U.S. Cl. 52—455 **5 Claims**

1. In the method of mounting replacement metal faced doors in existing door frame installations, the steps comprising:
A. forming a wooden frame including a pair of stiles and a pair of rails extending between the ends of the stiles so as to define a rectangular body with a cavity therewithin, the stiles and rails having inner and outer surfaces and front and rear faces, said stiles being formed with channels extending along the length thereof and spaced inwardly from the outer surface thereof a distance of at least one-fourth inch;

B. placing a pair of metal panels on the opposite sides of said frame, the side margins of said panels having inturned lips extending along the length thereof which are fitted into said channels of said stiles, the top and bottom margins of said panels terminating inwardly of said outer surfaces of the rails a distance of at least one-fourth inch;

C. adhering the overlying portions of said panels to said stiles and rails;

D. foaming in place in said cavity a synthetic resin composition to provide a foam core bonded to said panels and to said rails and stiles to provide the replacement door, the rails, stiles, core and metal panels being bonded together in a unitary monolithic structure;



E. removing from the frame of the existing door installation the door to be replaced;

F. trimming said replacement door to fit the frame of said existing door installation; and

G. mounting said replacement door upon said frame of said existing door installation

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4,152,877

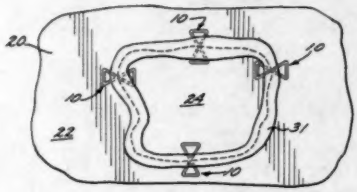
WALL REPAIR CLIP

Leonard O. Green, 620 E. Pine, Santa Ana, Calif. 92701

Filed Jun. 26, 1978, Ser. No. 918,762

Int. Cl.[2] E04G *23/02*

U.S. Cl. 52—514 **3 Claims**



1. Apparatus for supporting a plaster patch in a plaster wall comprising:

a wire clip convolved by bending to form a Z shaped substantially planar structure, one end of said Z shaped structure extending in an orthogonal segment aligned substantially normal to the plane thereof, the end of said orthogonal segment being bent to form a wall piercing segment directed substantially parallel to the plane of said Z shaped structure.

4,152,878

STUD FOR FORMING FIRE-RATED WALL AND STRUCTURE FORMED THEREWITH

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 803,083, Jun. 3, 1977, abandoned, which is a continuation of Ser. No. 580,993, May 27, 1975, abandoned. This application Dec. 27, 1977, Ser. No. 864,170

Int. Cl.[2] E04B *2/30, 2/78*

U.S. Cl. 52—481 **19 Claims**

1. A stud adapted for use in constructing a wall comprised of a pair of spaced-apart coplanar layers of gypsum wallboard panels, the panels of each layer being in abutting relationship, said wall having a plurality of said studs interposed between said layers of wallboard panels and affixed thereto, said stud being formed of a unitary integral sheet metal structure and comprising:

(A) A first wallboard panel layer-engaging structure comprising:

(1) a first flange-forming panel comprising

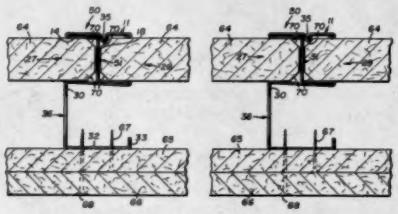
(a) an outer panel member extending to a first fold, and

(b) an inner panel member connected at said first fold and folded over a surface of said outer panel member and extending to a second fold intermediate the edges of said outer panel member, thereby forming a pair of flanges one on each side of said second fold,

(2) a web connected at said second fold and extending away from said first flange-forming panel disposed substantially perpendicular thereto and terminating at a third fold, and

(3) a second flange-forming panel positioned substantially parallel to said first flange-forming panel comprising:

(a) an inner panel member connected at said third fold and extending substantially perpendicular to said web to a fourth fold, and



(b) an outer panel member connected at said fourth fold and folded over said inner panel member and extending beyond said web to a fifth fold, thereby forming a pair of flanges one on each side of said web with each flange being continuous along substantially the entire length of said stud,

said first and said second flange-forming panels and said web cooperating to form an H-shaped structure in cross-section defining oppositely directed channels for receiving and restraining adjacent wallboard panels in three directions; and

(B) means for supporting a second layer of gypsum wallboard panels spaced apart from said first layer of panels comprising:

(1) a supporting web connected at said fifth fold and extending away from said second flange-forming panel and terminating in a sixth fold, and

(2) a wallboard-supporting panel connected at said sixth fold extending in a direction substantially parallel to and spaced-apart from said first and second flange-forming panels and having its outer surface free of apendages, thereby being adapted to permit said second layer of panels to extend across and be affixed to the entire outer surface of said supporting panel.

4,152,879

SPIRAL-WRAP APPARATUS

Michael H. Shulman, 45 Bruce Farm Dr., Toronto, Ontario, Canada (M2H 1G4)

Filed Jun. 21, 1977, Ser. No. 808,456

Int. Cl.[2] B65B *11/04*

U.S. Cl. 53—399 **10 Claims**

7. A method of wrapping a palletized load on a wrapping apparatus having a rotatable platform for receiving the load, film dispensing means adjacent the platform for receiving a roll of film of a width less than the height of the load, and means for rotating the platform while moving the film-dispensing means

vertically in order to enwrap the load helically, comprising the steps:

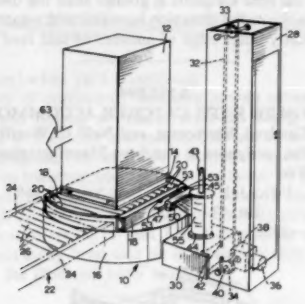
(a) providing an elongated member pivoted adjacent one end to the platform for swinging movement adjacent a side of the load,

(b) providing a substantially horizontal frictional surface on the platform below the level of the bottom of the load, against which the elongated member in one position can bear,

(c) providing automatic film-severing means on the platform adjacent the frictional surface,

(d) gripping an end of the film between the elongated member and the frictional surface,

(e) rotating the platform while simultaneously moving the film-dispensing means vertically upwardly and then downwardly through at least one up and down cycle, thereby to enwrap the load helically, and during said at



least one cycle swinging the elongated member through an arc of about 180° in the vertical plane away from said frictional surface to a position below the level of the bottom of the load to take said elongated member out of the path of subsequent film convolutions,

(f) halting the rotation of the platform when the film-dispensing means is substantially at the bottom of its movement and with the said side of the load toward the film-dispensing means,

(g) and swinging the elongated member back through its vertical arc toward the frictional surface, thereby catching the portion of the film extending between the film-dispensing means and the load, pulling it down below the level of the bottom of the load, and entrapping it between the elongated member and the frictional surface, and

(h) severing the film with severing means located on the platform adjacent the frictional surface, the severing being on the load side of the gripping location.

4,152,880

DEVICE FOR PACKING FLAT ARTICLES

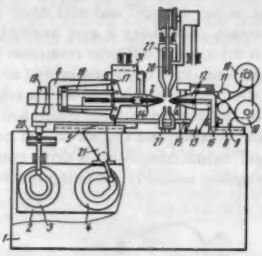
Ivan A. Kolosov, ulitsa Astrakhanskaya, 118, kv. 54; Jury E. Ivanyatov, ulitsa M. Zatonskaya, 21, and Anatoly K. Khoroshilov, prospekt Entuziastov, 26-a, kv. 36, all of Saratov, U.S.S.R.

Filed Sep. 6, 1977, Ser. No. 830,620

Int. Cl.[2] B65B *9/02, 11/50*

U.S. Cl. 53—553 **5 Claims**

1. A device for packing flat articles, such as battery electrodes in a separating material comprising: a bed; a grip device including jaw means mounted on said bed for holding and moving an article to be packed jointly with said material; a material feeding mechanism, installed on said bed in line with said grip device, comprising a carriage and a pair of supply reels of material for said material feeding mechanism; means linking said carriage of said material feeding mechanism kinematically with said grip device for reciprocation jointly with said grip device; a guide for the material installed on said carriage; said guide having a slot open on at least the side facing said grip device for accommodating said article to be packed, a fixed stop limiting said slot at the side opposite to the grip device; driving means for providing said reciprocating motion to said grip device and to said carriage so that said grip device and said guide are adapted to be in joint reciprocating



motion but not synchronous movement, and that accurate setting of the positions of said carriage and said grip device is ensured for the packing of said articles with a predetermined spacing between successive articles; and means for severing and sealing said material about at least two sides of said article.

4,152,881

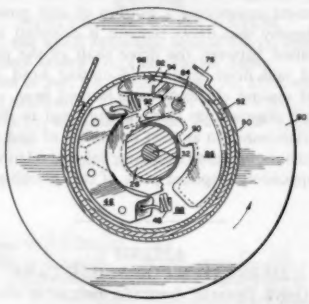
LAWN MOWER BLADE ROTATION WARNING DEVICE

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed May 5, 1977, Ser. No. 794,010

Int. Cl.[2] A01D *69/00, 69/08, 69/10*

U.S. Cl. 56—11.3 **9 Claims**



1. In a lawn mower having a rotary blade which is normally either driven by a motor through a releasable clutch having a driver connected to the motor or braked by a releasable brake, means for generating a warning signal in the event the clutch and brake are both sufficiently disengaged to permit the blade to rotate under its own momentum, said means comprising a signal generating device operative in response to overrunning rotation of the blade relative to the clutch driver for generating a warning signal, and means operable during overrunning rotation of the clutch driver relative to the blade for inactivating said signal generating device.

4,152,882

VEGETATION CUTTING ASSEMBLY

Tyson W. Howard, 709 N. Church Ave., Mulberry, Fla. 33860

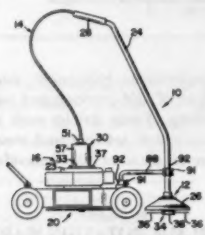
Filed Sep. 3, 1976, Ser. No. 720,276

Int. Cl.[2] A01D *55/18*

U.S. Cl. 56—13.7 **3 Claims**

1. A vegetation cutting assembly of the type primarily designed to be driven from a lawn mower having a power drive source and operated at a substantially remote location there-

from, said cutting assembly comprising: power take-off means disposed in driven relation to the power drive source; a cutting head drivingly interconnected to said power take-off means; drive cable means disposed in drivingly interconnected relationship between the power source and said cutting head; and gear adjustment means disposed in power transmitting relation between said power take-off and said drive cable, said gear adjustment means comprising a gear assembly whereby said drive cable is driven at a different rotational speed from said power take-off; said drive cable comprising an elongated flexible configuration being attached in driven relationship at one end thereof to said gear adjustment means and being drivingly attached at the opposite end thereof to said cutting head, said power take-off means comprising a drive coupling assembly, said drive coupling assembly including a drive element, one



end of said element being threadedly connected to the drive shaft of the power drive source and the opposite end of said element being matingly attached in locking engagement with a drive socket element, said drive socket element being correspondingly configured as said opposite end and said drive socket element comprising a portion of said power take-off means, whereby said drive element is disposed in interconnected relation between the drive shaft of the power drive source and said drive cable, said cutting head including a plurality of cutting elements each formed from a semi-rigid material and disposed on said cutting head in diametrically opposed relationship to at least one other of said plurality of cutting elements, whereby a counter balance relationship exists between oppositely disposed pairs of said plurality of cutting elements.

4,152,883

HARVESTER FOR SUGAR CANE

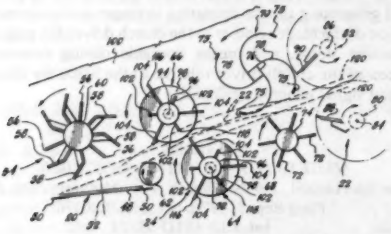
Donald J. Quick, Branvan, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed Apr. 7, 1977, Ser. No. 785,465

Claims priority, application United Kingdom, Apr. 20, 1976, 15887/76

Int. Cl.[2] A01D *45/10*

U.S. Cl. 56—13.9 **9 Claims**



1. A harvester for sugar cane or similar crops comprising:
a frame including a pair of laterally spaced gathering walls defining a throat;
base cutting means capable of severing crop sticks from their roots mounted on the lower forward portion of the frame;
cane chopping means operative to cut cane sticks into two or more pieces mounted on the frame above and to the rear of the base cutting means;
and roller means rotatably mounted on the frame for conveying severed cane sticks through said throat from said base cutting means to said cane chopping means;
said roller means comprising at least one driven roller rotatable about a rotation axis extending longitudinally of the roller;
said roller comprising a support and a plurality of feed elements mounted on the support and extending longitudinally of the roller with outer edges that are engageable with said crop sticks;
and wherein the distance measured in the radial direction between said rotation axis and the radially outer edge of one of the feed elements is greater than the distance measured in the radial direction between said rotation axis and the radially outer edge of another of said feed elements.

4,152,884

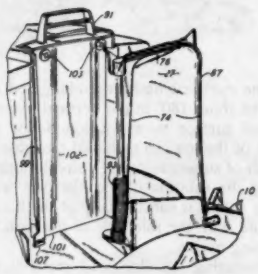
LAWN MOWER WITH CATCHER ACCOMMODATION

Merlin H. Gandrud, Sturtevant, and Neill C. Woelffer, Racine, both of Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

Filed Jul. 22, 1977, Ser. No. 818,168

Int. Cl.[2] A01D *53/08, 53/06*

U.S. Cl. 56—202 **9 Claims**



1. A lawn mower with catcher accommodation, comprising a mower housing having a fore-and-aft central axis and a rear portion rearwardly disposed relative to said axis and along an upright plane transverse to said central axis and said housing having opposite sides at the lateral limit positions of said housing and flanking said rear portion, a grass cutter bar in said housing, a handle attached to said housing and extending rearwardly thereof, said housing having a grass clipping discharge opening on said rear portion and directed rearwardly of said housing and toward said handle and being located on one side of said central axis, a door hingedly mounted on said housing on an upright hinge axis adjacent said central axis and extending in line with said upright plane of said housing rear portion to have said door extend over said discharge opening in the closed position and being hingedly movable off said discharge opening and through substantially 180 degrees, a spring on said housing and connected with said door to urge said door to its said closed position, grass catcher attachment portions spaced apart on said housing adjacent said upright plane and presenting horizontally faced abutment surfaces, and a bag type of grass catcher extending along said central axis and including an adapter of rigid material extending across one end of said catcher and with said adapter having a grass inlet opening extending through one side of said adapter and aligned with said discharge opening, said adapter extending along said upright plane and being removably attached to said mower housing by moving downwardly thereon in said upright plane and into contact with said attachment portions' abutment surfaces,

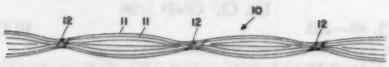
said adapter being disposed to abut said door in the open position of said door and with said spring arranged to urge said door against said adapter to have the latter urged against said attachment portions and be held onto said mower through the spring force on said door.

4,152,885

INTERLOCKED YARN AND METHOD OF MAKING SAME

Paul R. Cox, Jr., Cary, N.C., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jul. 1, 1977, Ser. No. 812,202
Int. Cl.[2] D02G *3/34, 3/38*
U.S. Cl. 57—207 **5 Claims**



1. An interlocked yarn comprising:

a plurality of continuous filaments having substantially no twist and having at spaced intervals along the length thereof at least one continuous filament of said plurality encircling most of said other filaments to interlock said filaments together, said encircling obtained by passing said filaments through a fluid jet and passing a fluid medium through said jet in a direction substantially counter to the direction of travel of said filaments and by pulling the filaments away from said jet at a rate less than the rate at which the filaments enter said jet.

4,152,886

PROCESS FOR MAKING YARN HAVING ALTERNATE SECTIONS OF GREATER AND LESS BULK AND PRODUCT THEREOF

Thomas L. Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 772,865, Feb. 28, 1977, abandoned. This application Dec. 7, 1977, Ser. No. 858,199
Int. Cl.[2] D02G *1/16, 3/24, 3/34*
U.S. Cl. 57—208 **16 Claims**

1. A bulked continuous filament nylon yarn composed of individually crimped filaments having a repeating pattern comprising a first section having one level of bulk adjacent a second section having a different level of bulk, the section with the lower level of bulk having fewer crimps per unit length and nodes of interlaced filaments at its opposite ends.

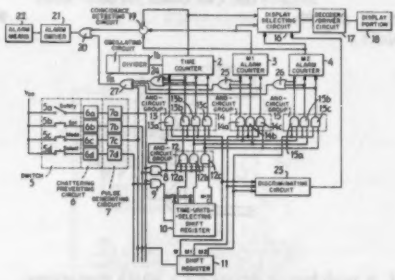
4,152,887

DIGITAL ELECTRONIC ALARM TIMEPIECE

Takuro Fukuichi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Mar. 11, 1977, Ser. No. 776,891
Claims priority, application Japan, Mar. 15, 1076, 51-27803
Int. Cl.[2] G04C *21/16*
U.S. Cl. 58—19 R **6 Claims**

1. A digital electronic alarm timepiece comprising standard signal generating means, circuit means for frequency-dividing the signal generated by said standard signal generating means, time counting circuit means for counting output signals of said dividing circuit means to provide a time signal, alarm time memory counting circuit means, setting means including manually operable switching means for selectively amending the count of said time counting circuit means to correct the time signal and for amending the count of said alarm time memory counting circuit to set a selected alarm time, visual display means controlled by said setting means for selectively displaying the time signal of said time counting circuit means and the set time of said alarm time memory counting circuit means, coincidence circuit means having inputs connected respectively with said time counting circuit means and said alarm time memory counting circuit means to detect coincidence



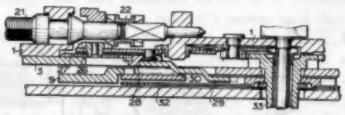
between said time signal and said set alarm time, an OR circuit having a first input connected with an output of said coincidence circuit means and a second output connected with said setting means, alarm driver means connected to the output of said OR circuit and alarm sound generating means connected to and driven by said alarm driver means, hereby said alarm sound generating means is activated to produce an alarm sound upon coincidence of said time signal and set alarm time and upon operation of said setting means to set an alarm time.

4,152,888

ELECTRONIC WRIST WATCH

Ryo Namiki, and Kenzi Miyasaka, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 755,807, Dec. 30, 1976, abandoned. This application Feb. 7, 1978, Ser. No. 875,757
Claims priority, application Japan, Jan. 8, 1976, 51-849; Jan. 9, 1976, 51-1873
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—58 **3 Claims**



1. An electronic watch comprising

a base plate,

a rear plate secured to said base plate,

a battery cell secured in an aperture in said base plate,

a control stem mounted on said base plate,

a calendar mechanism including a calendar display correcting means and a display feed gear opposite said control stem and a control member overlapping said battery cell,

said calendar display correcting means being positioned adjacent said control stem,

a display guide plate mounted on said base plate through said rear plate,

said display guide plate engaging said rear plate and being positioned to form with said rear plate a reinforced support for said battery cell,

said display feed gear comprises a date feed pawl and a day feed pawl superposed on said date feed pawl, and

said calendar display correcting means comprises a first gear pivotally mounted on said base plate in engagement with a stem gear on said control stem, a correction gear pivotally mounted on said base plate in engagement with said

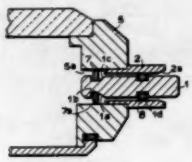
first gear, and a lever means for correcting the day and date displays.

4,152,889

PUSH BUTTON DEVICE FOR WATCH CASING

Tsunetoshi Sekiguchi, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1977, Ser. No. 815,237
Int. Cl.[2] G04B *37/08*
U.S. Cl. 58—90 B **9 Claims**



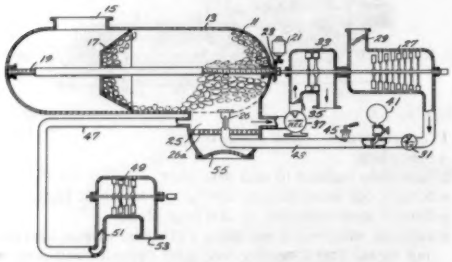
1. A push button device for a watch comprising:
(a) a watch casing having a through hole therein;
(b) a pipe having a first portion with an outside diameter substantially equal to a diameter of the through hole and fitted into the through hole and a second portion with an outside diameter greater than the diameter of the through hole and projecting from the through hole;
(c) a push button inserted into the pipe and provided with first and second grooves therein;
(d) an elastically deformable engaging ring fitted about the first groove and having an outside diameter greater than an inside diameter of the first portion; and
(e) a waterproofing ring fitted about the second groove and having an outside diameter substantially equal to an inside diameter of the pipe.

4,152,890

SOLID FUEL INTERNAL COMBUSTION ENGINE

Carl W. Weiland, 2980 Interlaken, Orchard Lake, Mich. 48033

Continuation of Ser. No. 586,753, Jun. 13, 1975, abandoned.
This application Jul. 11, 1977, Ser. No. 814,699
Int. Cl.[2] F02C *3/26*
U.S. Cl. 60—39.03 **14 Claims**



1. A solid fuel internal combustion engine comprising:
a tank for storing particulated solid fuel therein,
a combustion chamber positioned proximate to said tank including grate means for dividing the combustion chamber into a combustion zone for receiving solid fuel and an ash collection zone therebelow, said solid fuel being preheated by the exhaust gases from said combustion chamber,
means for controllably conducting a combusting agent directly into the solid fuel in said combustion chamber solely by a nozzle located above said grate means and in direct contact with the solid fuel in the combustion zone so that a combustion area is formed within said combustion zone radially around the nozzle, the combustion area having a size extending radially about said nozzle relative to the quantity of inflowing combusting agent, and
a power turbine for controllably receiving exhaust gases from said combustion chamber, said power turbine driving a utilization device.

4,152,891

PYROTECHNIC COMPOSITION AND METHOD OF INFLATING AN INFLATABLE AUTOMOBILE SAFETY RESTRAINT

Eugene F. Garner, Canyon Country, Calif., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 11, 1977, Ser. No. 840,692
Int. Cl.[2] C06D *5/06*
U.S. Cl. 60—205 **10 Claims**

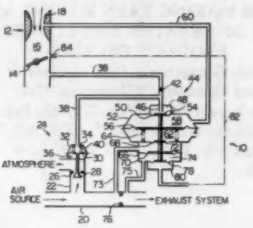
1. A pyrotechnic composition comprising:
from about 15 to 30% by weight of tartaric acid;
from about 40 to 75% by weight of sodium chlorate; and
from about 10 to 30% by weight of calcium hydroxide.

4,152,892

SECONDARY AIR SUPPLY DEVICE FOR ENGINE EXHAUST SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 13, 1976, Ser. No. 749,900
Claims priority, application Japan, Dec. 20, 1975, 50/151225
Int. Cl.[2] F02B *75/10*; F01N *3/10*
U.S. Cl. 60—290 **18 Claims**



1. A secondary air supply device for supplying secondary air into the exhaust system of an internal combustion engine provided with a carburetor having a throttle valve rotatably disposed within the air-fuel mixture inducting passage thereof and a venturi portion located upstream of the throttle valve, said secondary air supply device comprising:
a pressurized secondary air supply conduit connecting an air source and the exhaust system for supplying secondary air from the air source into the exhaust system, said secondary air supply conduit having an orifice therein;
a vent conduit branched off from said secondary air supply conduit upstream of said orifice;
a vacuum operated valve operatively disposed in said vent conduit and operative in response to the intake manifold vacuum downstream of the throttle valve to vent an excessive secondary air fed into said secondary air supply conduit; and
control means for controlling the intake manifold vacuum applied to said vacuum operated valve by the cooperation of the venturi vacuum generated at the venturi of the carburetor and the pressure differential between upstream and downstream sides of said orifice in said secondary air supply conduit in order to accurately control the amount of the secondary air supplied to the exhaust system in response to the amount of the intake air of the engine, said control means including a first pressure responsive dia-

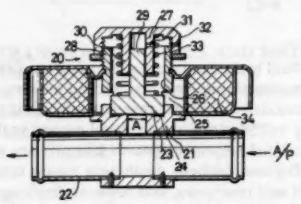
phragm which is responsive to the venturi vacuum, a second pressure responsive diaphragm fixedly connected through a connecting member to said first pressure responsive diaphragm and responsive to the pressure differential between the upstream and downstream sides of said orifice in said secondary air supply conduit for moving said first pressure responsive diaphragm in response to the pressure differential acting on the second pressure responsive diaphragm, and valve means for controlling the intake manifold vacuum applied to said vacuum operated valve in response to the movement of said first and second pressure responsive diaphragms.

4,152,893

INTERNAL COMBUSTION ENGINE SECONDARY AIR CONTROL SYSTEM

Nobuaki Wakita, and Ryuichi Deguchi, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 23, 1977, Ser. No. 799,255
Claims priority, application Japan, Jan. 6, 1977, 52-238
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—290 **7 Claims**



1. A relief valve for use in an internal combustion engine having an exhaust system and means for injecting secondary air for treating the exhaust gas, said relief valve comprising:

a casing having a valve seat and a bore therethrough in communication with a source of secondary air that is pressurized by an air pump;

a movable valve stem having a valve head that defines a pressure receiving area at one end thereof in opposition to said valve seat, said valve head being arranged with respect to said valve seat such that the pressure receiving area of said valve changes when said relief valve is open;

a valve body having a bore therein for slidably receiving said valve head;

a cap secured to said valve body, said cap including a central extension having a bore therein for receiving said valve stem and a first air bleed hole formed through the wall of said extension, said first air bleed hole being fully opened when said valve head is in engagement with said valve seat and said relief valve is fully closed, said first air bleed hole being closed by said valve stem when said valve head moves out of engagement with said valve seat, said bore in said extension, in combination with said valve stem, defining an air damping chamber; and

spring means extending between said cap and said valve head for normally biasing said valve head against said valve seat;

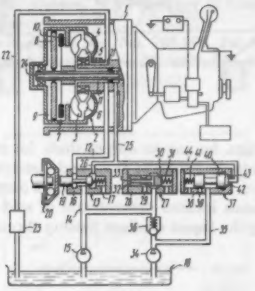
whereby relieved air pressure is not applied against said valve head when said relief valve is opened and the air damping chamber is operable to absorb the vibration due to the pulsating action of the air pressure caused by the output pressure of the air pump when the valve is opened.

4,152,894

CONTROL SYSTEM OF HYDRAULIC TORQUE CONVERTER OF TRANSPORT VEHICLE

Leonid A. Rumyantsev, Moscow; Vasily T. Avershin, Bryansk; Vladimir Y. Ilnitsky, Bryansk, and Ivan L. Jurin, Bryansk, all of U.S.S.R., assignors to Tsentralny Nauchno-Issledova-Telsky Avtomobilny i. Avtomotorny Institut "Nami", Moscow and Proizvodstvennoe Ubiedinenie "Baz", Bryansk, both of, U.S.S.R.

Filed Nov. 16, 1977, Ser. No. 852,102
Int. Cl.[2] F16D *33/02*
U.S. Cl. 60—347 **2 Claims**



1. A control system of a hydraulic torque converter of a transport vehicle comprising: an impeller wheel, a turbine wheel, a first space formed by said impeller and turbine wheels; a coupling for locking said impeller and turbine wheels and having a second space defined therein; a pump; a fluid source communicating with the inlet of said pump; a first discharge line one end of which is connected to the outlet of said pump while the other end communicates with both said first space formed by said impeller and turbine wheels and said second space in said locking coupling; a changeover valve mounted in said first discharge line; the engine of said transport vehicle having a shaft and an RPM transmitter indicating the rotational speed of said shaft and linked kinematically with said changeover valve for selective communication of said spaces with said first discharge line depending on the rotational speed of the shaft of said engine; a reducing valve mounted in said first discharge line and intended to put it in communication with the source of fluid; an auxiliary pump; said fluid source communicating with the inlet of said auxiliary pump; a second discharge line of said auxiliary pump, one end of which is connected to the outlet of said auxiliary pump while its other end is connected to said first discharge line of said pump; a nonreturn valve mounted in said second discharge line of said auxiliary pump; a valve mounted in said second discharge line of said auxiliary pump, actuated by the pressure of the fluid contained in said second space of said locking coupling of said impeller and turbine wheels and communicating said second discharge line of said auxiliary pump with said source of fluid.

4,152,895

WAVE POWERED MOTOR

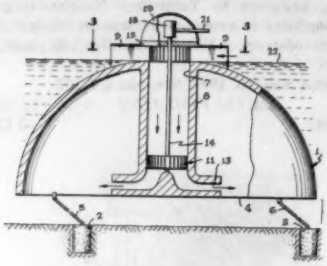
Leslie S. Wirt, Newhall, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Feb. 21, 1978, Ser. No. 879,360
Int. Cl.[2] F03B *13/12*
U.S. Cl. 60—398 **20 Claims**

20. Wave motor apparatus for converting surface wave energy propagated via a liquid medium into useful rotating shaft power, comprising:

a refractive horn means having a mouth portion and a throat portion non-reflectivity transforming the intercepted surface waves at said mouth portion to pulses of predominatly kinetic energy at said throat portion;

a hollow cylindrical standpipe having an input end and an output end, said input end being coupled to the throat portion of said refractive horn for receiving and temporarily storing said pulses of kinetic energy;



turbine means, having an output shaft, for receiving kinetic energy supplied thereto from said standpipe, and imparting a continuous rotary motion to its output shaft; and,

diffuser means located downstream of said turbine for discharging the liquid medium passing through said apparatus.

4,152,896

HYDRAULIC POWER SYSTEM WITH A LOAD-SENSING AND A CUTOFF CONTROL VALVE

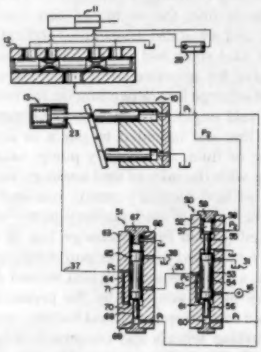
Hideaki Tohma, Yokohama, and Kazuo Uehara, Tokyo, both of Japan, assignors to Kabushika Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,306

Claims priority, application Japan, Mar. 31, 1977, 52-38603[U]

Int. Cl.[2] F16H *39/46*

U.S. Cl. 60—445 **4 Claims**



1. A hydraulic control system for a variable displacement hydraulic pump powering a load actuator, comprising in combination:

a pump actuator for adjusting the displacement of the pump;

a source of hydraulic fluid under pressure for powering the pump actuator;

a load-sensing control valve including first resilient means and adapted to control communication between the pump actuator and the source in accordance with a differential between the sum of the output pressure of the pump and the pressure of the pump actuator and the sum of the pressure of the load actuator and the force of the first resilient means; and

a cutoff control valve connected serially with the load-sensing control valve and including second resilient means, the cutoff control valve being adapted to control communication between the pump actuator and the source in accordance with a differential between the force of the second resilient means and the sum of the output pressure of the pump and the pressure of the pump actuator.

4,152,897

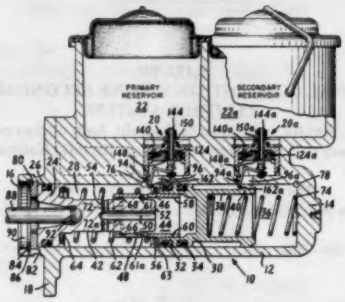
TANDEM BRAKE MASTER CYLINDER

Edward J. Falk, St. Louis County, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.

Continuation of Ser. No. 667,427, Mar. 16, 1976, abandoned. This application Jun. 7, 1978, Ser. No. 913,521

Int. Cl.[2] B60T *11/20*

U.S. Cl. 60—562 **2 Claims**



1. In a fluid brake tandem master cylinder of the type having a cylinder containing first and second pistons slideably and sealably coaxially disposed therein and defining primary and secondary cylinder regions, first and second brake fluid reservoirs associated respectively with said primary and secondary cylinder regions, resilient diaphragm means covering the top of each of said reservoirs, said resilient diaphragm means sealably separating brake fluid in said reservoirs from air outside said reservoirs, means on said diaphragm means to permit said diaphragm means to be drawn into said reservoirs as brake fluid is depleted, first and second compensating means for permitting the entry of brake fluid from said first and second reservoirs to said cylinder during the return stroke of said first and second pistons and for permitting open communication between said reservoirs and said cylinder when said first and second pistons are in their fully brakes-off position, wherein each of said first and second compensating means comprises:

(a) a fluid channel from said compensating means entering the side wall of said cylinder;

(b) separating means for separating fluid in the associated reservoir from fluid in said channel, said separating means having a first hole therein;

(c) a sliding stem slidingly engaged in said first hole and having a first end in fluid communication with said reservoir and a second end in fluid communication with said channel;

(d) said separating means having a rigid part adjacent said reservoir mating with a resilient part adjacent said channel, said resilient part being in sealing engagement with the sliding stem;

(e) said first hole passing aligned through said rigid and resilient parts;

(f) a flexible lip on said resilient part;

(g) at least a second hole in said rigid part, said at least a second hole facing said flexible lip;

(h) said resilient part sealing said second hole when positive gauge pressure exists in said cylinder and said flexible lip permitting fluid to flow from said reservoir through said channel to said cylinder when a negative gauge pressure exists in said cylinder;

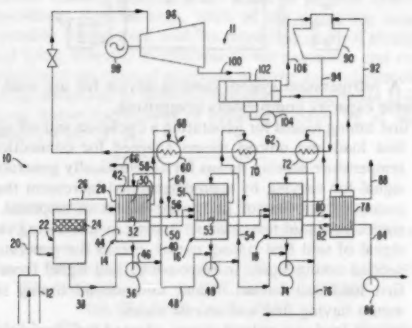
(i) an actuating lever having first and second ends, said first end protruding through said channel into said cylinder;
(j) means for hingeably connecting the second end of said actuating lever to the second end of said sliding stem;
(k) a fulcrum between said first and second ends of said actuating lever;
(l) means moving with said first and second pistons for engaging and displacing said first end of their associated actuating levers when said pistons are moved to their fully brakes-off position;
(m) said displacing being operative to pull said valve stem from a first to a second position;
(n) displacement of said first end of the actuating lever by said moving means causing sliding movement of said stem in said first hole between first and second fixed predetermined positions;
(o) resilient means biased between said rigid part and said sliding stem for urging said sliding stem toward its first position;
(p) a third hole in said stem having first and second openings; and
(q) said first and second openings bypassing said separating means and providing open fluid communication through said third hole between said reservoir and said channel in the second position of said stem and said resilient part blocking said first opening in the first position of said stem and cutting off fluid communication through said third hole.

4,152,898

ENERGY TRANSFER APPARATUS AND METHOD USING GEOTHERMAL BRINE

Leon Awerbuch, Tel Aviv, Israel, assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Aug. 1, 1977, Ser. No. 820,983
Int. Cl.[2] F03G 7/00
U.S. Cl. 60—641 **22 Claims**



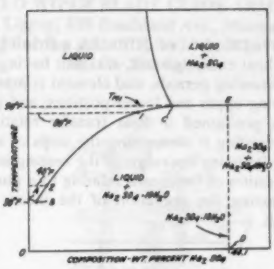
13. A method of handling geothermal brine comprising: moving geothermal brine along a first path from a geothermal well; flashing the brine at a first station along said first path to form steam; moving the brine from the first station through a series of other stations at spaced locations along the path; moving the steam generated at the first station into heat exchange relationship with the brine passing through the second station to generate steam at the second station and to cause the incoming steam to the second station to form a condensate; directing a first portion of the steam generated at the second station into heat exchange relationship with the brine flowing through the third station to generate steam at the same; repeating the moving and directing steps for all stations after the second station; directing a second portion of the steam generated at each station into heat exchange relationship with a binary fluid flowing through a second path; producing useful work as a function of the flow of binary fluid along said second path; and removing the condensate from each station and collecting the same for use as fresh product water.

4,152,899

THERMAL ENERGY STORAGE AND RELEASE UTILIZING COMBINED SENSIBLE HEAT AND LATENT HEAT OF FUSION

Carlyle S. Herrick, Alplaus, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 706,894, Jul. 19, 1976, abandoned. This application Jan. 28, 1977, Ser. No. 763,658
Int. Cl.[2] B01D 9/02
U.S. Cl. 62—4 **4 Claims**



1. The method for storing and releasing thermal energy comprising the steps of:

employing as the medium into which thermal energy is to be absorbed and from which said thermal energy is to be removed a two phase, two component system having a phase diagram including a liquidus, the phases employed being liquid and solid and one of said components being water with the second component being a hydrate-forming salt;

adjusting the amounts of the two components and the temperatures of the resulting medium such that said medium is a saturated aqueous solution having initial temperature-composition values coinciding with a first temperature-composition point on said liquidus;

removing thermal energy from said medium to reduce the temperature thereof and simultaneously nucleating the formation of hydrate crystals of the second component at substantially said first temperature-composition point after which as the removal of thermal energy continues hydrate crystals continue to form and the temperature-composition values of said medium change proceeding along said liquidus to some predetermined temperature-composition point at a lower temperature than the temperature of said first temperature-composition point;

heating said medium to increase the temperature thereof to redissolve said hydrate and cause said medium to approach said initial temperature-composition along said liquidus;

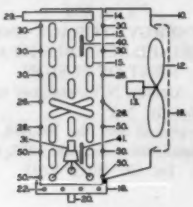
repeating the temperature cycling of the previous steps whereby the sensible heat of water and the heat of fusion of said hydrate-forming salt are simultaneously employed in the thermal energy storage and retrieval; and

stirring said medium during said temperature cycling to induce inter-particle motion to hydrate crystals present therein sufficient to maintain said medium in equilibrium whereby said temperature cycling occurs substantially only along said liquidus.

4,152,900
REFRIGERATION COOLING UNIT WITH NON-UNIFORM HEAT INPUT FOR DEFROST

Ram K. Chopra, Trenton, N.J., and Daniel E. Kramer, Yardley, Pa., assignors to Kramer Trenton Co., Trenton, N.J.

Filed Apr. 4, 1978, Ser. No. 893,512
Int. Cl.[2] F25D *21/00, 21/06*
U.S. Cl. 62—80 13 Claims

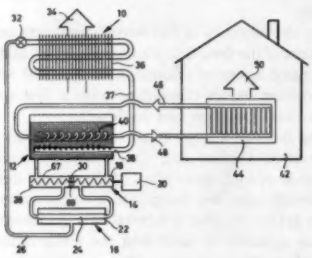


1. An improved method of defrosting a frosting element of an air cooling heat exchange unit, said unit having air cooling periods and defrosting periods, said element comprising a heat exchanger having upper and lower portions; and independent heating means positioned in heat transfer relation to each portion for defrosting it comprising the steps of substantially simultaneously initiating operation of the heating means, terminating the operation of the means relating to a portion, subsequently terminating the operation of the means relating to another portion.

4,152,901
METHOD AND APPARATUS FOR TRANSFERRING ENERGY IN AN ABSORPTION HEATING AND COOLING SYSTEM

Carl G. Munters, Minusio, Switzerland, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Dec. 21, 1976, Ser. No. 752,730
Claims priority, application Sweden, Dec. 30, 1975, 7514789
Int. Cl.[2] F25B *15/00, 7/00, 17/08*
U.S. Cl. 62—112 6 Claims



1. In a closed absorption system based on the heat pump principle, in which a solution of working medium is vaporized in an evaporator by heat exchange with an energy source and the vaporized solution is passed into an absorber where it is brought into contact with an absorbent solution, the heat of condensation being removed from the absorber for use to condition an enclosure, the improvement comprising:

(a) a pressure sealed separation means having a high pressure and a low pressure zone;

(b) a semi-permeable membrane defining said high pressure zone and said low pressure zone;

(c) means for passing a mixture of absorbent solution and working medium into said separator means;

(d) means for pressurizing said mixture effective to separate and collect a concentrated solution of absorbent in said high pressure zone and the working medium solution in said low pressure zone by reverse osmotic flow through said semi-permeable membrane;

(e) energy transfer means between said high pressure zone and said absorber to depressurize said concentrated absorbent solution;

(f) means for passing said pressurized concentrated absorbent solution through said energy transfer means into said absorber;

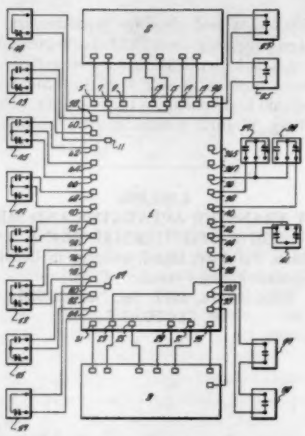
(g) expansion means connected to said evaporator; and

(h) means for passing said separated working solution through said expansion means to said evaporator.

4,152,902
CONTROL FOR REFRIGERATION COMPRESSORS

Lawrence E. Lush, P.O. Box 1704, Crestline, Calif. 92325

Continuation-in-part of Ser. No. 652,296, Jan. 26, 1976, abandoned. This application May 23, 1977, Ser. No. 799,341
Int. Cl.[2] F25B *5/00*
U.S. Cl. 62—157 36 Claims



1. A refrigeration system control device for use with two variable capacity compressors comprising,

a first timing means for generating a cyclic on and off signal,

a first load and unload means adapted for connection to temperature sensing means for automatically generating a signal for varying by a predetermined increment the capacity of the first of said compressors in response to a signal from said temperature sensing means during the on signal of said first timing means, means for generating a second timing signal in response to said signal from said first load and unload means, said second timing signal means having first and second states,

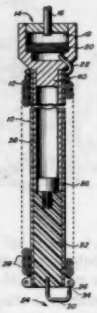
a second load and unload means adapted for connection to said temperature sensing means for automatically generating a signal for varying by a predetermined increment the capacity of the second of said compressors in response to a signal from said temperature sensing means during the on signal of said first timing means, means for generating a third timing signal in response to said signal from said second load and unload means, said third timing signal means having first and second states, and

a first transfer means for automatically activating either said first load and unload means or said second load and unload means during the on signal of said first timing means in response to said second and third timing signals, wherein said first load and unload means is activated when said third timing signal means is in a first predetermined state and said second load and unload means is activated when said second timing signal means is in a first predetermined state.

4,152,903
BIMATERIAL DEMAND FLOW CRYOSTAT

Ralph C. Longsworth, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 13, 1978, Ser. No. 896,012
Int. Cl.[2] F25B 41/04
U.S. Cl. 62—222 16 Claims



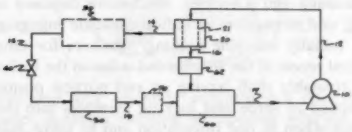
1. In a demand flow cryostat wherein (1) a refrigerant is supplied through an elongated heat exchanger having a warm end and a cold end disposed in a container, (2) the refrigerant is expanded through a Joule-Thompson expansion orifice at the cold end of the heat exchanger to produce an inventory of liquid in the container proximate the cold tip of the cryostat, and (3) a valve member for controlling refrigerant flow through the orifice is disposed adjacent to the orifice and is movable relative to the orifice to effect a throttling movement between the orifice and the valve member with reduction in temperature, whereby flow of refrigerant through the orifice is controlled as a function of the temperature,

the improvement which comprises separate mounting means for the orifice and for the valve member disposed and affixed relative to each other so as to provide relative movement therebetween, each of the mounting means operably cooperating with its respective control element and being movable in response to the expansion and contraction of the control elements, and the control elements being composed of different materials whose mean cryogenic linear coefficients of expansion differ by at least about 1×10^{-5}/° K.

4,152,904
ABSORPTION HEATING-COOLING SYSTEM

Jarrett C. Hester, Clemson, S.C., assignor to Clemson University, Clemson, S.C.

Division of Ser. No. 703,836, Jul. 9, 1976, Pat. No. 4,062,197.
This application Oct. 6, 1977, Ser. No. 839,763
Int. Cl.[2] F25B 15/00, 33/00
U.S. Cl. 62—476 15 Claims



1. Apparatus for effecting heat transfer in a particular area comprising:

(a) a pressure differential membrane separator unit, said membrane separator unit being capable of osmotic separation of at least a portion of refrigerant from a refrigerant-absorbent solution while rejecting absorbent, thereby yielding an absorbent enriched solution;

(b) heat transfer means operatively associated with said membrane separator to receive separated refrigerant therefrom and effect a heat transfer on said refrigerant, whereby a heat exchange is experienced in an area affected thereby;

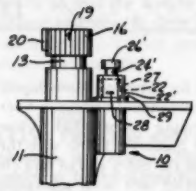
(c) an absorber operatively associated with said heat transfer means to receive refrigerant therefrom and operatively associated with said membrane separator unit to receive absorbent enriched solution therefrom, whereby said refrigerant is absorbed by said absorbent enriched solution to reconstitute said refrigerant-absorbent solution; and

(d) refrigerant-absorbent solution pumping means operatively associated with said absorber and said membrane separator unit for receiving reconstituted refrigerant-absorbent solution from said absorber and pumping same to said membrane separator unit for repeating the heat transfer cycle.

4,152,905
METHOD AND APPARATUS FOR REPAIR OF WINDSHIELD WIPER BLADE GUIDE ARM PIVOT PIN

Raymond R. Lippay, 839 Beechland Ave., Munhall, Pa. 15120

Filed Sep. 12, 1977, Ser. No. 832,171
Int. Cl.[2] F16C 1/00
U.S. Cl. 64—1 C 8 Claims

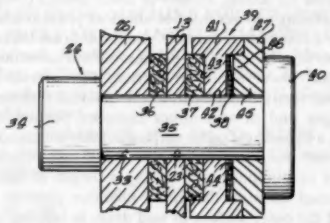


1. A dual arm windshield wiper blade transmission assembly comprising, a transmission body, a shaft received through a bore in said body for reciprocal rotation therein, a lever secured to one end of said shaft for imparting reciprocal rotation thereto, a head secured to the other end of said shaft for attachment of a wiper blade arm, and a guide arm pivot pin secured to said body in parallel to said shaft and adjacent to said head to pivotally receive a wiper blade guide arm thereon, the improvement consisting of a replacement guide arm pivot pin coaxially received in stationary engagement over a remaining broken base portion of said pivot pin.

4,152,906
VARIABLE CONTROLLED SPRING PRESSURE LOCK

William L. Brown, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 12, 1977, Ser. No. 796,288
Int. Cl.[2] F16D 3/66
U.S. Cl. 64—15 B 9 Claims



1. A retainer for a diaphragm spring to be utilized with securing means for an assembly wherein the spring pressure is

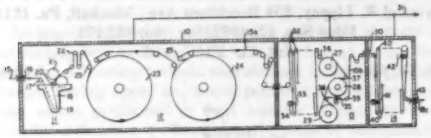
accurately controlled, said retainer comprising a housing having a recess at one end to receive a diaphragm spring therein and of a depth substantially equal to the height of the unstressed diaphragm spring, and a retainer cap having a flange abutting said housing and a central projection received in said recess to engage and compress the spring to a set tolerance, the depth of said projection being slightly less than the depth of the recess so that the spring is substantially flattened when said projection is received in the housing with the flange in engagement therewith.

4,152,907

AMMONIA PROCESSING OF FABRICS

Jackson Lawrence, West Sand Lake, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.

Division of Ser. No. 695,471, Jun. 14, 1976, Pat. No. 4,099,911.
This application Mar. 6, 1978, Ser. No. 883,517
Int. Cl.[2] D06M 1/02
U.S. Cl. 68—5 D **5 Claims**



1. Apparatus for the continuous liquid ammonia processing of fabric webs containing cellulosic fibers, which comprises
(a) means forming a substantially closed treating chamber,
(b) means for guiding a fabric web through said chamber,
(c) means near the entry end of said chamber for impregnating said fabric web with substantially anhydrous liquid ammonia,
(d) means for treating the ammonia-impregnated web to drive off most of said ammonia,
(e) means on the downstream side of the treating means for applying moisture to at least one surface of the fabric web,
(f) means for treating the moistened web to cause the applied moisture to penetrate the fabric,
(g) the moisture applied to said fabric serving to replace the residual ammonia in the fabric,
(h) means for effecting at least partial removal of the applied moisture, and
(i) means for thereafter discharging the fabric from said chamber.

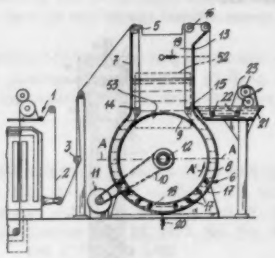
4,152,908

DEVICE FOR THE CONTINUOUS SETTING OF WOOLLEN OR UNION FABRICS

Attilio Bertoldi, Via Luzzago 27, Manerbio (Brescia), Italy

Filed Oct. 6, 1977, Ser. No. 839,838
Claims priority, application Italy, Oct. 15, 1976, 28361 A/76
Int. Cl.[2] D06B 3/22
U.S. Cl. 68—9 **5 Claims**

1. Apparatus for setting woolen or union fabrics comprising:
a vessel defining a lower interior chamber portion adapted to receive a rotatably mounted cylindrical drum therein, and an upper interior chamber portion in fluid communication with said lower chamber portion, the interior of said vessel normally being open to the external atmosphere at the upper end of said upper chamber portion; a drum having a cylindrical outer surface rotably mounted within said lower interior chamber portion of said vessel;
means for continuously conducting a length of fabric into said vessel through the upper chamber portion thereof around the outer surface of said drum in lapping contacting relationship thereto and out of said vessel through the upper chamber portion thereof;
means for filling said vessel with liquid and for maintaining said liquid at a level defined by a horizontal plane passing through said upper chamber portion so that said drum is completely immersed in said liquid;
means situated within said lower chamber portion proximate to the lower portion of the surface of said drum for injecting steam maintained at a temperature higher than 100° C.



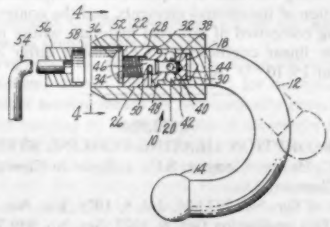
into liquid immediately adjacent to the fabric portion lapping said lower portion of said drum, said adjacent liquid being maintained at a temperature greater than 100° C. by the elevated hydrostatic pressure existing in said lower chamber portion.

4,152,909

LOCK

George A. Lundberg, Kinnelon, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Jun. 6, 1977, Ser. No. 803,796
Int. Cl.[2] E05B 67/36
U.S. Cl. 70—34 **2 Claims**

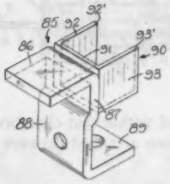


1. A lock and shackle assembly, comprising a shackle having a peripheral recess near one end, and a lock assembly comprising a housing and a locking mechanism disposed inside the housing, said mechanism including a shackle engaging member having radially movable locking members for entering the peripheral recess of the shackle end when in the locking condition, a rotatable shaft having an end portion positioned and dimensioned to force said locking members into the locking condition when in one orientation and to allow said locking members to move to the unlocking condition when in another orientation, spring means biasing said shaft in rotation toward the locking orientation, said shaft having an operating head at the end opposite the locking members, said head having a plan shape that appears to be substantially circular and is sufficiently out-of-round to enable it to be rotated against the force of the spring to the unlocking orientation by a tool having a recess corresponding in shape to that of the operating head.

4,152,910
METER BOX GUARD LOCK

James A. Swisher, Shelton, Conn., assignor to C. Cowles & Company, New Haven, Conn.

Filed Oct. 7, 1977, Ser. No. 840,147
Int. Cl.[2] B65D *55/14;* E05B *65/52*
U.S. Cl. 70—159 5 Claims

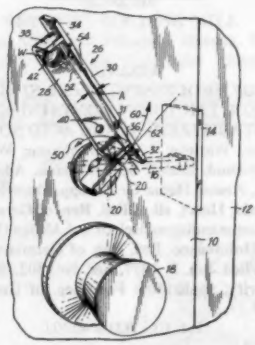


1. A locking assembly for a box having walls and being closed by a flanged cover comprising, an angle piece having a first portion adapted to overlie the cover and a second portion adapted to rest against a wall of the box adjacent the flange of the cover, a bolt passing through and projecting from the box wall and provided with a nut for securing said second portion to said wall with the first portion overlying the cover, a housing covering and enclosing on at least four sides the angle piece and said securing means, and a lock within the housing and holding the housing releasably in covering position, the angle piece having a third portion projecting from the second portion and the housing lock being engageable with said third portion, the angle piece being provided with at least one wing piece having a part which extends to a point close to the interior surface of the housing spaced a maximum distance from the angle piece.

4,152,911
SAFETY DEVICE FOR A KNOB CONTROLLED DOOR LOCK

Prannath Sharma, 4 Park Ave., New York, N.Y. 10016

Filed Nov. 4, 1977, Ser. No. 848,470
Int. Cl.[2] E05B *15/00, 17/00*
U.S. Cl. 70—416 4 Claims

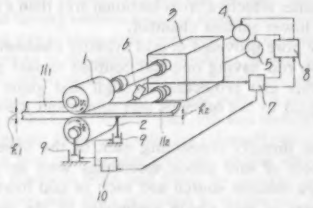


1. A door and lock assembly comprising a door having opposite sides, a frame defining an opening adapted to be closed by said door, and a bolt in said door to be displaced into said frame to lock said door thereto, a pivotable control knob on said door on one side of the same and coupled to said bolt to control displacement of the same, said knob being pivotable between limits at first and second positions, said bolt being displaced into said frame in correspondence with the first position of the knob and out of said frame in correspondence with said second position, and means pivotable into and out of a position of interference with respect to the pivoting of said knob and adapted, when in a position of interference, to brace said knob in said first position to lock said bolt in said frame, said means including a pivot defining a pivot axis, said knob including a portion for engagement with said means, said portion defining a path of movement which is a circular arc upon pivoting of said knob, a tangent to said arc, at said portion with the knob in said first position, passing within twenty degrees of said pivot axis, said means including a rigid structure pivotable on said axis to a position between said axis and said portion, said structure having a length substantially corresponding to the distance between said axis and said portion with said knob in said first position, said means being on the same side of the door as said knob and spaced in entirety from the other side of the door, said rigid structure being at least a part of a bar, said means including a first flange on said bar defining one limit of said part and adapted to be positioned at right angles to said tangent and to engage said knob with the latter in said first position, said bar having a longitudinal axis and said first flange being perpendicular thereto, a second flange on and perpendicular to said bar, said second flange also being perpendicular to the first said flange, said first flange having a path of movement which is an arc passing adjacent said knob in the first position thereof and being adapted to abut said knob, with the knob in said first position, approximately along a tangent to the latter said arc, the knob being positioned generally below said pivot so that the weight of said means tends to pivot the same into engagement with said knob, said bar and second flange defining an L-shaped cross-section, said second flange being longer than said bar.

4,152,912
METAL ROLLING PROCESS AND MILL

Hiroyuki Shiozaki, Yokosuka, and Masao Mikami, Fujisawa, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1978, Ser. No. 880,933
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—10 2 Claims



1. A metal rolling process which comprises detecting the shape of the rolled metal, and controlling the ratio in peripheral velocity between an upper work roll and a lower work roll in response to the detected shape of the rolled metal in such a way that the rolled metal may have a desired shape.

4,152,913
STRAIGHTENING MACHINE FOR STRAIGHTENING SHEET METAL AND FLAT MATERIALS

Horst Zerhoch, Sinzheim, and Karl Vohringer, Malsch, both of Fed. Rep. of Germany, assignors to Horst Zerhoch Vörrichtungs und maschinenbau GmbH & Co. KG, Sinzheim, Fed. Rep. of Germany

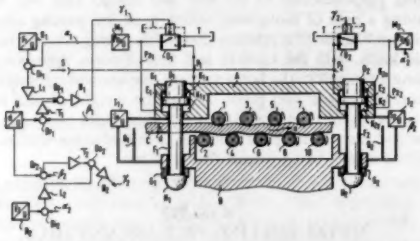
Filed Dec. 20, 1977, Ser. No. 862,528
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657876
Int. Cl.[2] B21D *1/02*
U.S. Cl. 72—20 13 Claims

1. A material straightening apparatus comprising:
a material inlet and a material outlet defining a path of material flow;
an upper roller frame disposed between said inlet and outlet along said path, said upper roller frame housing a first

plurality of forcibly driven parallel straightening rollers disposed along said path and transverse with respect thereto;

a lower roller frame disposed between said inlet and outlet along said path, said lower roller frame housing a second plurality of forcibly driven parallel straightening rollers disposed along said path and transverse with respect thereto, said second plurality of straightening rollers being arranged in the interstices between said first plurality of straightening rollers;

at least one pair of pressure medium operated piston assemblies for causing relative movement between said first and second frames and for locking said frames at predetermined relative positions, a first assembly of said pair of interconnecting said upper and lower frames in the vicinity of said inlet, and a second assembly of said pair interconnecting said upper and lower frames in the vicinity of said outlet, each of said piston assemblies comprising



a cylinder chamber contained in one of said upper and lower frames,

a piston reciprocating in said chamber which divides said chamber into an upper and lower annular chamber, said upper annular chamber of each piston assembly having a smaller effective cross-sectional area than a respective said lower annular chamber,

a guide bore provided in said cylinder chamber,

a piston rod having one end coupled to said piston and another end projecting through said guide bore and coupled to the other of said upper and lower frames, and

means for directly connecting each of the upper annular chambers of said piston assemblies with an adjustable pressure medium source and each of said lower annular chambers of said piston assemblies to the output of a servo-controlled pressure reducing valve supplying a pressure medium from a source.

4,152,914

APPARATUS FOR PRODUCTION OF METAL RIBBON

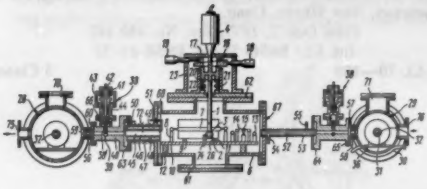
Mikhail D. Tyavlovsky; Semen P. Kundas; Mechislav N. Los; Valentin J. Serenkov, and Nikolai V. Vyshinsky, all of Minsk, U.S.S.R., assignors to Minsky Radiotekhnichesky Institut, Minsk, U.S.S.R.

Filed Apr. 5, 1977, Ser. No. 784,687

Int. Cl.[2] B21J *29/00*

U.S. Cl. 72—38 **10 Claims**

1. An apparatus for the production of metal ribbon from wire, comprising a working chamber adapted to be sealed and evacuated to form a vacuum chamber; an anvil and a striker forming working tools mounted for axial vibration within said chamber, the axial direction of vibration of the anvil being skew to the axial direction of vibration of the striker; sources of ultrasonic vibrations coupled to said working tools, said anvil being constructed in such manner that a standing wave mode is formed therein for a given frequency of said ultrasonic vibration source coupled to said anvil; pay-off, and take-up power reels for wire and for metal ribbon being produced from the wire, said reels being arranged on both sides of said working tools; a means for heating said working tools and wire, said



means being arranged within said chamber; and a ribbon tension control mechanism arranged between said reels.

4,152,915

HALOGENATED POLYCONDENSATES OF FATTY ALCOHOL-ACIDS FOR AQUEOUS METAL-WORKING FLUIDS AND METHOD OF MACHINING A METAL WITH SAID FLUIDS

Giancarlo Bussi, and Pierpaolo Baradel, both of Trieste, Italy, assignors to Aquila S.p.A., Trieste, Italy

Filed Jun. 14, 1978, Ser. No. 916,046

Claims priority, application Italy, Jun. 17, 1977, 24828 A/77

Int. Cl.[2] B21B *45/02;* **B11C** *3/00;* **C10M** *3/14, 3/24*

U.S. Cl. 72—42 **18 Claims**

1. A composition comprising at least one salt of an acid selected from the group consisting of (1) polycondensates of a fatty alcohol-acid, (2) mineral esters of polycondensates of a fatty alcohol-acid, and (3) mixtures thereof, wherein the carbon chain of said fatty alcohol-acid contains halogen atoms and from 10 to 22 carbon atoms and wherein said salt is selected from the group consisting of alkaline salts, amine salts, ammonium salts and mixtures thereof.

4,152,916

METHOD OF PROCESSING STEEL STRIP USING A ROLLING OIL EMULSION CONTAINING SiO_2 AS A STABILIZED SILICIC ACID SOL

Yves Guinomet, Waltrop; Ulrich Tenhaven; Wilhelm Wrede, both of Dortmund; Rudolf Schoenemann, Adenau; Wolfgang Friedemann, Neuss; Heinz Groschopp, Dusseldorf, and Hans G. Germscheid, Hosel, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 802,788

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625105

Int. Cl.[2] B21B *45/02*

U.S. Cl. 72—42 **12 Claims**

1. In a method for processing steel strip in the presence of a lubricating and anti-sticking composition, which comprises the steps of cold-rolling the steel strip, coiling the rolled steel strip and annealing the coiled steel strip, wherein the improvement comprises applying to said steel strip, prior to coiling, a lubricating and anti-sticking composition consisting essentially of a rolling oil emulsion, containing 0.1 to 5 percent by weight of SiO_2 in the form of a stabilized silicic acid sol and having a pH value between 5.0 and 9.0, to thereby prevent any sticking together or welding of the turns of the coiled steel strip during annealing.

4,152,917
HOT ROLLING PILGER MILL

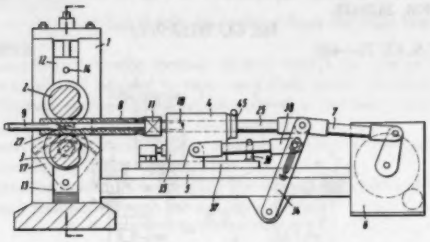
Emil Vorbach, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,539

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2712061

Int. Cl.[2] B21B *21/00*

U.S. Cl. 72—189 **10 Claims**



1. Hot rolling mill stand of the pilger variety comprising:
upper and lower bearing and roll mount means being displaceable in relation to each other transversely to a direction of rolling;
upper and lower pilger rolls respectively journalled in the bearing and roll mount means;
first and second pinion means respectively drivingly connected to the upper roll and the lower roll;
first and second segment gears respectively meshing the first and second pinion means and being pivotally mounted respectively on the upper and lower bearing means;
a drive; means for drivingly linking the drive to the first and second segment gears for imparting upon them and through them upon the rolls oscillatory movement;
a feeder with mandrel rod for carrying and positioning a blank; and
means for linking the feeder to the drive to reciprocate in synchronism with the oscillatory movement of the rolls.

4,152,918
VERTICAL ROLLING MILL

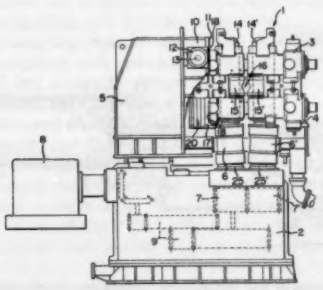
Teruaki Tanaka, Aichi, and Takayuki Haruna, Tokai, both of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 27, 1977, Ser. No. 845,974

Claims priority, application Japan, Nov. 1, 1976, 51-146920[U]

Int. Cl.[2] G21B *31/08*

U.S. Cl. 72—238 **3 Claims**



1. A vertical rolling mill, comprising: a frame having a substantially horizontal sole plate and an upright frame portion extending upwardly from said sole plate adjacent to one lateral end of said sole plate, the zone above said sole plate and located between said frame portion and the opposite lateral end of the sole plate being open at its top and being adapted to receive a roll stand, said upright frame portion having front and rear sections which extend partway toward the opposite lateral end of said sole plate, said sections having opposed upright walls which define an open-top guide compartment between said sections and opening laterally into said zone, said sections each also having a vertical guide wall facing toward said opposite lateral end of said sole plate;
driving means mounted on said frame and comprising a pair of vertical driven spindles which are rotatable about vertical axes in opposite circumferential directions and which extend upwardly to the lower end of said zone;
a pair of holding members mounted in the opposed upright walls of said sections, said holding members having movable locking projections mounted thereon and adapted to be moved between an advanced position in which they project into said compartment from opposite sides thereof and a retracted position in which they are retracted from said compartment;
a roll stand positioned in said zone, said roll stand having a pair of rolls mounted thereon for rotation about vertical axes of rotation, said rolls being mounted in parallel circumferentially adjacent relation, each roll having a single circumferential groove in the periphery thereof with said circumferential grooves being positioned in vertical alignment with each other to define a caliber through which the material to be rolled can be moved, said roll stand having front and rear vertical guide surfaces for respectively vertically slidably engaging the vertical guide walls of said front and rear sections, said vertical guide surfaces of said roll stand extending parallel to the direction of movement of the material to be rolled through said caliber, said roll stand including a portion located between said front and rear guide surfaces which portion projects laterally into said compartment between said opposed upright walls of said front and rear sections, said roll stand portion having vertical grooves aligned with said movable locking projections and receiving said movable locking projections in the advanced positions thereof so that said locking projections prevent horizontal movement of said roll stand relative to said upright portions of said frame, means at the lower ends of said rolls and vertically slidable with respect to said spindles for releasably drivingly connecting said rolls to said spindles, so that said roll stand can be removed from said frame by moving said locking projections into their retracted positions and then lifting said roll stand upwardly.

4,152,919
COIL CONVEYOR APPARATUS

Wilfried Bald, and Hans Pölking, both of Hilchenbach, Fed. Rep. of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 30, 1977, Ser. No. 865,935

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659500

Int. Cl.[2] B21B *41/06, 39/34*

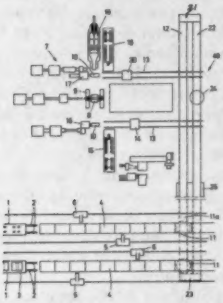
U.S. Cl. 72—250 **7 Claims**

1. Apparatus for conveying strip coils, comprising:
(a) a rolling mill having an uncoiler at the entrance side and a coiler at the exit side,
(b) an elongated shelf storage accessible for insertion and removal of coils from both sides,
(c) coil-moving equipment consisting of two spaced, parallel, long roller conveyors joined at their ends by short cross conveyors to form an elongated closed plane figure whose long dimension is parallel to and spaced from the roll pass line of the mill, said two long roller conveyors consisting of a first long conveyor for moving coils away

from the shelf storage and a second long roller conveyor for moving coils toward the shelf storage,

(d) a track with a car extending from the first long roller conveyor to the uncoiler,

(e) a track with a car extending from the coiler to the first long roller conveyor at a point downstream of the first conveyor,



(f) loading means extending along one side of the shelf storage for inserting a coil into the shelf storage, and

(g) unloading means extending along the other side of the shelf storage for removing a coil from the shelf storage and delivering it to the first long roller conveyor.

4,152,920

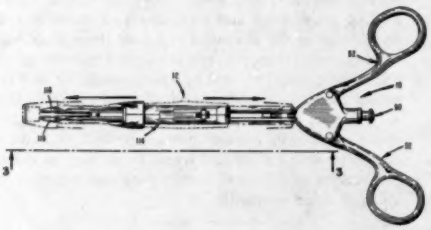
SYSTEM FOR APPLYING SURGICAL CLIPS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Stamford, Conn.

Filed Oct. 17, 1977, Ser. No. 843,063

Int. Cl.[2] B21D *9/08;* **A61B** *17/10*

U.S. Cl. 72—410 **27 Claims**



1. A novel system for applying surgical clips comprising an instrument and a disposable cartridge,

(1) said disposable cartridge having

(a) elongated blade means defining at one end a pair of opposed jaws resiliently spaced apart,

(b) actuation means movable relative to said blade means to close said jaws together, and

(c) cartridge housing means movably mounted on said blade means adapted to contain a plurality of surgical clips and feed them singly to a predetermined position relative to the jaws of said blade means so that movement of said cartridge housing means relative to said blade means will transfer the clip in said predetermined position to said jaws properly oriented to be clinched by said jaws,

(2) said instrument comprising

(d) a body, and

(e) driver means mounted on said body for movement, said instrument and disposable cartridge defining mutually coacting quick detachable means to quick detachably fix said disposable cartridge in said instrument with said actuation means drivable by said driver means to close the jaws of said blade means to clinch a clip held therein.

4,152,921

METHOD AND APPARATUS FOR THE SHOCK PRESSURE SHAPING

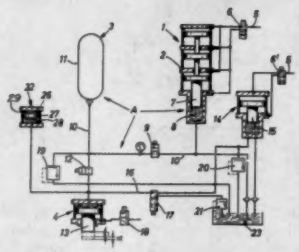
Herbert R. Dits, Schmelz, Fed. Rep. of Germany, assignor to Transform Verstarkungsmaschinen Aktiengesellschaft, Bous, Fed. Rep. of Germany

Filed May 24, 1977, Ser. No. 800,072

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623428

Int. Cl.[2] B21J *9/12*

U.S. Cl. 72—441 **4 Claims**



1. An apparatus for impact shaping of workpieces comprising:

high pressure storage means for storing an hydraulic fluid;

a first control valve means;

hydraulic ram means connectable to said high pressure storage means by said first control valve means, and adapted for mounting a shaping tool;

a second control valve means;

second hydraulic pressure supply means connectable to said hydraulic ram means via said second control valve means; and

a gas spring of adjustable spring constant connected in permanent fluid communication with the hydraulic ram means to permit adjustment of the impact characteristics of the apparatus.

4,152,922

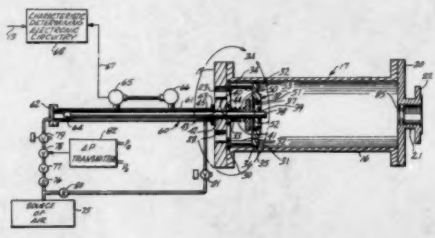
APPARATUS AND METHOD FOR DETERMINING THE CHARACTERISTIC OF A FLOWMETER

Edward E. Francisco, Jr., Phoenix, Ariz., assignor to Flow Technology, Inc., Phoenix, Ariz.

Filed May 19, 1978, Ser. No. 907,681

Int. Cl.[2] G01F *25/00*

U.S. Cl. 73—3 **25 Claims**



1. Apparatus for measuring fluid flow comprising: a main conduit through which fluid flows from an upstream position to a downstream position;

a main movable member located within the conduit;

a passage through the main member providing a path for fluid flow from the upstream position to the downstream position;

releaseable means for restraining the main member at the upstream position of the conduit; and

means for blocking the passage, the member being adapted to move through the conduit from the upstream position to the downstream position as a fluid barrier in synchronism with fluid flow when the passage is blocked, the improvement characterized in that the restraining means comprises:

an auxiliary conduit fluidically isolated from the main conduit;

an auxiliary movable member located within the auxiliary conduit and adapted to move as a fluid barrier the same distance through the auxiliary conduit as the main member moves through the main conduit;

means for interconnecting the auxiliary member to the main member to move together; and

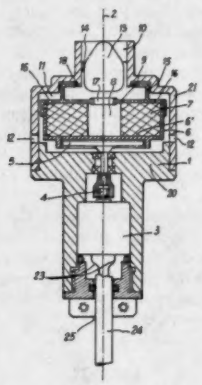
means for fluidically controlling the movement of the auxiliary member through the auxiliary conduit.

4,152,923

APPARATUS FOR SELECTIVELY SAMPLING DUST AND LIKE SOLID PARTICLES GRANULOMETRICALLY

Paul Courbon, Apremont, France, assignor to Carbonnages de France, Paris, France

Filed Apr. 21, 1978, Ser. No. 898,886
Claims priority, application France, Apr. 25, 1977, 77 12364
Int. Cl.[2] G01N *15/06*
U.S. Cl. 73—28 **4 Claims**



1. Apparatus for the selective sampling, in accordance with a granulometric cut, of dust and like solid particles suspended in a gaseous medium, said apparatus comprising:

a circular sampling chamber, at least one evacuation orifice communicating with said chamber through the periphery thereof, and an annular suction duct communicating with the chamber centrally thereof; and

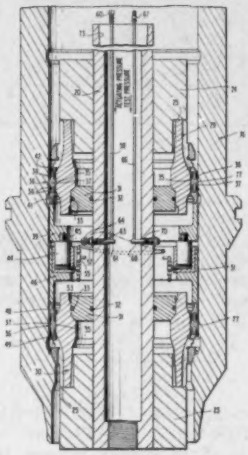
a rotor mounted in said sampling chamber for rotation at high speeds, said rotor comprising a support plate impermeable to the gaseous medium, and a thick rotary element of a material permeable to the gaseous medium rotationally fixed to the support plate, the rotary element being coaxial with said annular suction duct and defining a central supply duct having a central suction aperture, the internal diameter of said annular suction duct being substantially greater than the diameter of said central suction aperture, said rotor further comprising a circular collection casing coaxial with and at least partly covering the rotary element with the exception of said central suction aperture, the collection casing having, on its side nearer to said annular duct, a circular aperture whose diameter is at least equal to the external diameter of the annular duct.

4,152,924

SUB-SEA EQUIPMENT TEST AND ISOLATION TOOL

John H. Mayo, 404 Alonda Dr., Lafayette, La. 70503

Filed Jul. 17, 1978, Ser. No. 925,449
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—40.5 R **15 Claims**



1. A test and isolation tool for sub-sea well equipment comprising a tubular mandrel, retaining elements on opposite end portions of the mandrel, casing hanger bodies surrounding the mandrel inwardly of and between the retaining elements and having outer ends engaging the retaining elements, fluid sealing collars engaged between the mandrel and casing hanger bodies, expandable casing hanger seals on the exteriors of the casing hanger bodies adjacent to exterior sealing lands thereof, corresponding ends of said seals abutting rigid shoulders of said casing hanger bodies to prevent displacement of the seals axially toward th opposite ends of said mandrel, a piston head including multiple circumferentially spaced pistons surrounding said mandrel between the casing hanger bodies and including a skirt engaging the interior end of one casing hanger seal, a coacting axially opposing cylinder head including multiple circumferentially spaced cylinders for said multiple pistons, means for delivering seal energizing pressurized fluid through the bore of said mandrel to all of said cylinders to pressurize them and force said piston and cylinder heads apart axially for energizing said casing hanger seals, said cylinder head having a skirt engaging the interior end of the other casing hanger seal, and means for delivering seal testing pressurized fluid through the bore of the mandrel to the space surrounding the mandrel between said seals, whereby said seals may be placed in engagement with axially spaced internal sealing lands of a used well head housing to test the integrity of such lands.

4,152,925

DEVICE FOR DETECTING LEAKAGE IN HYDRAULIC SYSTEMS

K. Gösta Lindh, Sollentuna, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 30, 1977, Ser. No. 855,939
Claims priority, application Sweden, Dec. 14, 1976, 7614016
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—40.5 R **14 Claims**

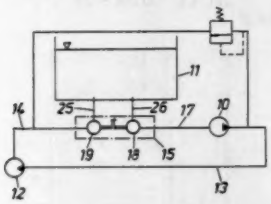
1. A device for supervising the fluid flow in hydraulic systems in order to detect fluid leakage, for example caused by

breakage of a hose in a supply conduit (13) or a drain conduit of a hydraulic power consumer, comprising:

a first rotating flow sensitive means (19; 28) in a first conduit of said hydraulic power consumer,

a second rotating flow sensitive means (18; 27) in a second conduit of said hydraulic power consumer,

said first and second flow sensitive means being operatively



connected to each other and having different capacities, and

means (16, 32; 31, 32) coupled to said first and second flow sensitive means for detecting at least a change in the direction of torque imparted to said first flow sensitive means relative to said second flow sensitive means caused by changes in fluid flow due to leakage in the hydraulic system.

4,152,926

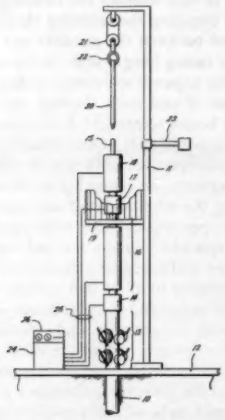
METHOD AND APPARATUS FOR TESTING THE CONNECTIONS BETWEEN PIPE SEGMENTS

Malvern M. Hasha, 1527 Castlerock, Houston, Tex. 77090

Filed Nov. 7, 1977, Ser. No. 849,309

Int. Cl.[2] G01M *3/28*

U.S. Cl. 73—46 **8 Claims**



1. The method of testing the connections between the pipe segments comprising a string of pipe being snubbed into a well under pressure immediately before such connections are forced into the pressurized well, including the steps of:

1. gripping with first gripping means attached to the well the string of the pipe being forced into the pressurized well;

2. placing an additional segment of pipe in position above the uppermost segment of the pipe string and connecting such additional segment of pipe to the uppermost segment of the pipe string;

3. moving vertically second gripping means and a testing apparatus for externally testing the connection between the additional segment of pipe and the pipe string;

4. operating the testing apparatus to test externally the connection between the additional segment of pipe and the pipe string;

5. depending upon whether the external test evidences the connection does or does not leak, performing one or the other of the following sets of steps:

(a) if there is no leak in the connection performing the steps comprising:

(1) releasing the testing apparatus from the connection;

(3) moving upwardly the second gripping means to the vicinity of the upper end of the additional pipe segment,

(3) gripping the additional pipe segment in the vicinity of its upper end with the second gripping means,

(4) releasing the first gripping means, and

(5) moving downwardly the second gripping means thereby forcing the string of pipe further into the pressurized well;

(b) if there is a leak in the connection, performing the steps comprising:

(1) releasing the testing apparatus from the connection,

(2) disconnecting the additional segment of pipe from the pipe string;

(3) making up a new connection between the pipe string and a segment of pipe, and

(4) repeating steps 3 and 5; and

6. repetitively repeating steps 1 through 5 until a selected length of pipe string has been snubbed into the pressurized well with the connections between the various pipe segments thereof being tested immediately before being snubbed into the well.

4. An apparatus for testing connections between pipe segments comprising a string of pipe being snubbed into a well under pressure immediately before such connections are forced into the pressurized well, comprising:

first gripping means attached to the well;

means for placing an additional segment of pipe in position above the uppermost segment of the pipe string;

means for connecting such additional segment of the pipe to the uppermost section of the pipe string;

second gripping means mounted above the first gripping means and mounted for vertical movement relative to the well;

a testing apparatus mounted above the second gripping means and mounted for movement therewith; and

means for providing vertical forces to the second gripping means to move the second gripping means and the testing apparatus mounted therewith a selected direction upwardly or downwardly.

4,152,927

VISCOSITY SIMULATOR

I-Ming Feng, Westfield, and Harold Shaub, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 3, 1978, Ser. No. 866,373

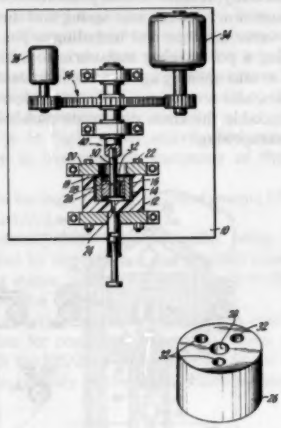
Int. Cl.[2] G01N *11/14*

U.S. Cl. 73—60 **10 Claims**

1. A viscosity simulator for measuring viscosity of liquids, comprising a sample holder including a cavity and a sleeve fixed within said cavity, spindle means operably mounted within said sleeve and comprising in combination a shaft and a drum having bottom and top surfaces, means for driving said spindle means, inlet means spaced from said bottom surface for introducing liquid within said sleeve into a test space between said bottom surface and said inlet means, wherein the improvement comprises:

said drum comprising a cylindrical member having at least an opening extending completely through said member between said top and bottom surfaces thereof substantially parallel to and radially spaced from the axis of rotation of said drum, said opening at said bottom surface being in

direct communication with said space, whereby air contained within said space passes through said opening as



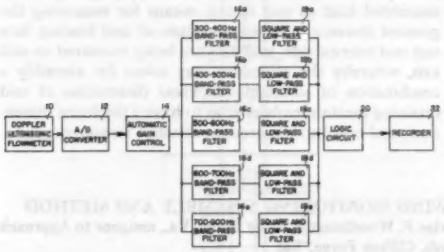
liquid is introduced into said test space from said inlet means.

4,152,928

SYSTEM FOR DETECTING FAT PARTICLES IN BLOOD

Richard A. Roberts, Boulder, Colo., assignor to University Patents, Inc., Norwalk, Conn.

Filed May 2, 1977, Ser. No. 792,893
Int. Cl.[2] G01N *15/00, 29/02, 33/16*
U.S. Cl. 73—61 R **13 Claims**



1. A system for producing signals indicative of the presence of fat particles in blood comprising, in combination:

a doppler ultrasonic flowmeter for generating an electrical signal representative of blood flow characteristics;

means responsive to said signal for detecting a peak of the power spectrum of said signal in relatively narrow frequency bands, having widths in the range between 50 and 120 Hz., over a relatively wide frequency range which includes a plurality of said narrow frequency bands; and

means for recording said detected peak.

4,152,929

ROOF BOLT TENSION DETERMINATION

Tibor O. Edmond, and Kenneth C. Kestler, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

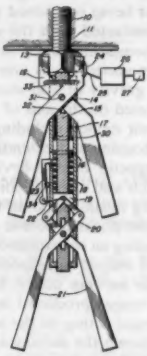
Filed Dec. 23, 1977, Ser. No. 863,778
Int. Cl.[2] G01B *17/04;* **G01N** *29/00*
U.S. Cl. 73—581 **5 Claims**

1. Apparatus for determining the tensile load on an elongated bolt comprising:

clamp means for attachment to a bolt head;

microphone means associated with said clamp means;

sound comparator means for receiving and reproducing sounds picked up by said microphone means, said sound comparator means also having capability for periodically



producing sounds representative of the sound from striking the head of a bolt having a particular tensile load; and

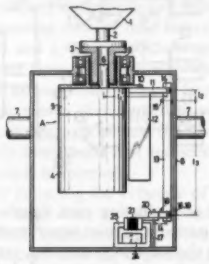
hammer means associated with said clamp means and adapted to strike a bolt head to which said clamp means is attached.

4,152,930

TORQUE-MEASURING DEVICE

Shoji Fujimoto, Nara, and Tatsuo Matsushima, Kashihara, both of Japan, assignors to Koyo Seiko Company Limited, Osaka, Japan

Filed May 17, 1978, Ser. No. 907,691
Claims priority, application Japan, Oct. 31, 1977, 52/131093
Int. Cl.[2] G01L *3/02*
U.S. Cl. 73—136 R **7 Claims**



1. A torque measuring device comprising:

a housing provided with handles,

a rotary machine provided with an output rotary shaft for imparting rotation to a rotary body which is an object to be inspected,

said rotary machine including an electric motor,

a mount base supported by said housing for swing motion around the axis of said output rotary shaft and supporting said rotary machine and contained in said housing together with said rotary machine,

said mount base being provided with a lever-like projection extending radially of said output rotary shaft, the center of gravity of the mount base including said rotary machine being located on the axis of bearings installed in the housing for supporting said output rotary shaft,

a torque transmitting lever supported for swing motion on a pivot shaft installed in said housing,

said lever being positioned so that its center of gravity is

located on the axis of said pivot shaft and that its proximal point of action is contacted with the front end of the lever-like projection on the mount base,

a second lever supported for swing motion on a second pivot shaft provided in said housing,

said second lever being positioned so that its proximal point of action is contacted with the distal point of action on said torque transmitting lever, said second lever having a moving coil mounted on its arm forming the distal side, the center of gravity of said second lever including said coil being located on the axis of its pivot shaft,

a magnetic circuit device including an magnetic iron core fixed to said housing and extending through said moving coil, said magnetic circuit device forming a magnetic circuit in which said moving coil is positioned, and

position detecting means disposed in said housing to detect variations in the position of said moving coil,

said means including an electronic circuit device arranged so that its current output corresponding to a variation in the position of the moving coil is fed back to the latter to assure that a torque produced in said mount base is balanced by a torque acting on the second lever through said moving coil during the measurement of torque, the value of the current flowing through said moving coil being detected to thereby measure the torque.

4,152,931

METHOD AND APPARATUS FOR EVALUATING YARN SIGNALS HAVING AN AT LEAST APPROXIMATELY PERIODIC COMPONENT

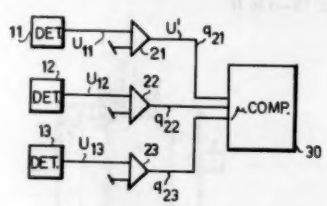
Werner Mannhart, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Feb. 17, 1978, Ser. No. 878,783

Claims priority, application Switzerland, Mar. 21, 1977, 3482/77

Int. Cl.[2] G01D *1/04*

U.S. Cl. 73—160 **9 Claims**



1. A method of evaluating yarn signals having at least one approximately periodic portion superimposed on an irregularity, comprising the steps of generating yarn signals representing the cross section or diameter of the yarn by means of detectors, determining the polarities of discrete values of the yarn signals, and detecting how often a coinciding polarity of the yarn signals is found in constant intervals τ, for all time intervals in a predetermined range.

4,152,932

FUEL INJECTION VALVES AND THEIR MANUFACTURE

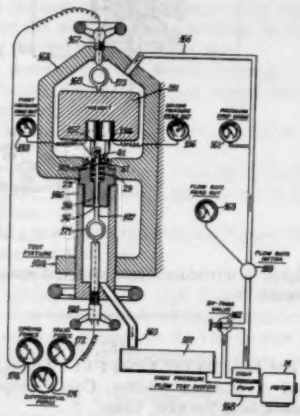
Lloyd E. Johnson, 700 Highview Rd., East Peoria, Ill. 61611

Division of Ser. No. 597,424, Jul. 21, 1975, abandoned. This application Feb. 16, 1978, Ser. No. 878,271

Int. Cl.[2] G01M *19/00*

U.S. Cl. 73—168 **11 Claims**

1. A fixture for use in assembling a fuel injection valve for an internal combustion engine, which valve comprises a body having two ends and an axis, a cylindrical chamber in one end and a valve seating surface near the other end, a compression spring and a valve member mounted within said body, said spring having two ends, said valve member having a head end portion and a retainer end portion, said head portion having a surface proportioned to fit in sealing relationship on the seating surface of said body, retainer means positioned to provide load carrying connection between said spring and the retainer portion in said valve member and including a pin, said retainer portion having a pin opening transverse to said axis with an internal side at said opening against which internal side the pin normally bears, said retainer means having at least one member having a selectable thickness dimension parallel to said axis, said fixture comprising:



means for holding said body, means for positioning said valve member axially into sealing relationship within said body, spring loading means having a loading face in a plane perpendicular to said axis and applying a specified assembled load to said spring, means for measuring the greatest distance between the plane of said loading face and said internal side, said distance being measured on said axis, whereby the assembler may select for assembly a combination of selectable thickness dimensions of said retaining means members so as to have a thickness dimension total equal to the greatest distance measured.

4,152,933

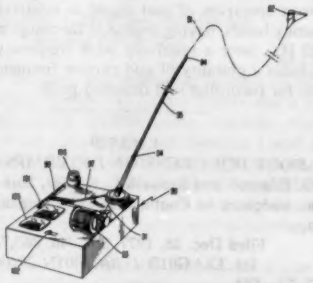
WIND MONITORING ASSEMBLY AND METHOD

Charles F. Woodhouse, Clifton Forge, Va., assignor to Approach Fish, Clifton Forge, Va.

Continuation-in-part of Ser. No. 674,231, Apr. 6, 1976, Pat. No. 4,058,010. This application Mar. 21, 1977, Ser. No. 779,518

Int. Cl.[2] G01W *1/02*

U.S. Cl. 73—189 **66 Claims**



1. The combination comprising:

(a) a kite connected at one end to a tether line,

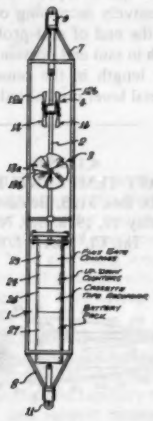
(b) a drogue tail means connected to the tether line and having sufficient buoyancy to lift the kite secured to the tether line in a no-wind condition,
(c) said drogue tail means being spaced from the kite by an amount sufficient to prevent any interference on the flight characteristics of the kite under active wind conditions,
(d) said drogue tail means being flexibly secured to the tether line to align downwardly with respect to the kite under active wind conditions,
(e) said kite in flight under active wind conditions being effective to override the buoyancy of the drogue tail means,
(f) said kite having a calibrated aerodynamic lift/drag flying characteristics,
(g) said aerodynamic characteristics being substantially unaffected by temperature and pressure changes,
(h) sensing means measures tension force on the tether line when the kite is flying,
(i) wind velocity computational means is connected to the tether line for combining the tension force on the tether line with the lift/drag characteristics of the kite to determine the velocity of the wind which sustains the kite in flight.

4,152,934

VECTOR MEASURING CURRENT METER

Robert A. Weller, San Diego, and Russ E. Davis, La Jolla, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1978, Ser. No. 882,500
Int. Cl.[2] G01W *1/02*
U.S. Cl. 73—189 **8 Claims**



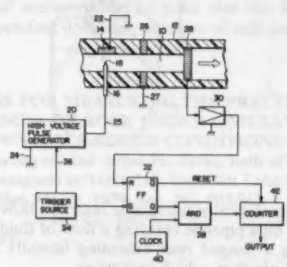
1. A vector-measuring current meter comprising:
a rod-like support member,
a pair of flow sensors mounted in a spaced relationship on said rod-like member,
each of said flow sensors including:
a pair of identical freely-rotatable fan members disposed back-to-back on a single rotational axis with said axes being disposed normal one to the other and also normal to the axis of said rod-like member,
each identical fan member of each pair of sensors being mounted for clockwise rotation responsive to current flow arriving from one direction and for counter-clockwise rotation for flow from the opposite direction with said rotational response being cosinusoidal relative to current vector components of fluid velocity parallel to the rotational axis of each fan member, and
means for detecting said rotational responses whereby the responses of both sensors can be combined to provide current speed and direction data.

4,152,935

MASS FLOW MEASURING APPARATUS

Hatsuo Nagaishi, Yokosuka, and Hiroyuki Maruoka, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 12, 1978, Ser. No. 868,916
Int. Cl.[2] G01F *1/56, 1/70*
U.S. Cl. 73—194 F **6 Claims**

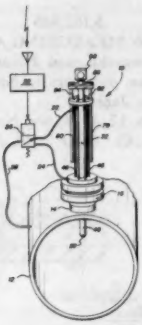


1. An apparatus for measuring the mass flow of fluid passing therethrough, comprising:
first means for ionizing the fluid to generate an electrically distinguishable fluid mass from the surrounding mass of fluid, said electrically distinguishable fluid mass migrating with the surrounding mass of fluid between a first predetermined point and a second predetermined point along the path of fluid flow, said second predetermined point being located downstream of said first predetermined point, said first means including first and second electrodes disposed in the path of fluid flow and biasing means for momentarily biasing said first and second electrodes at opposite potentials at intervals;
second means for detecting the presence of said electrically distinguishable fluid mass at said second predetermined point, said second means including a third electrode disposed in the path of fluid flow downstream of a unit of said first and second electrodes for collecting ions produced by said first means;
third means for determining a transit time of said electrically distinguishable fluid mass over the distance between said first and second predetermined points; and
fourth means for protecting said second means from being attacked by electro-magnetic waves generated by said first means upon operation of the same, said fourth means including an electrically conductive member which is grounded and located between the unit of said first and second electrodes and said third electrode, said electrically conductive member being formed into a cylinder having at its both ends inwardly extending flanges each of which define a center opening through which the fluid is passed via the interior of said cylinder, said cylinder being arranged and constructed to spacedly enclose the unit of said first and second electrodes permitting a part thereof to be located between the unit of said first and second electrodes and said third electrode.

4,152,936
REMOTELY CONTROLLED RETRACTABLE INSERTION FLOWMETER

John C. Boykin, Dallas; Edward R. Bryan, Wylie, and Don A. Pfautsch, Richardson, all of Tex., assignors to Electronic Flo-Meters, Inc., Dallas, Tex.

Filed Jul. 8, 1977, Ser. No. 813,949
Int. Cl.[2] G01F *1/10, 15/18*
U.S. Cl. 73—198 **11 Claims**



1. An automatically retractable insertion flowmeter apparatus for use on a pipeline carrying a flow of fluid therethrough and having a flanged riser extending laterally from the side wall of the pipeline, which comprises:

means for detecting the flow of fluid in the pipeline;

an elongate cylinder having a mounting flange on a first end of said cylinder for attachment to the flanged riser, said flange having a port therein communicating with the interior of said cylinder, and a closure on the second end of said cylinder, said closure having a port therein communicating with the interior of said cylinder;

a piston positioned within said cylinder for longitudinal movment therein between the ends under the influence of pressurized fluid admitted through one or the other of the ports in said closure and said mounting flange;

a stem extending longitudinally within said cylinder and through said mounting flange, said stem being attached to said piston for movement therewith and having said fluid flow detection means mounted thereon for insertion into and retraction from the pipeline;

means for selectively directing pressurized fluid through the port in said closure to translate said piston toward the pipeline thereby inserting said fluid flow detection means into the pipeline and for directing pressurized fluid through said mounting flange to translate said piston away from the pipeline thereby withdrawing said fluid flow detection means from the pipeline; and

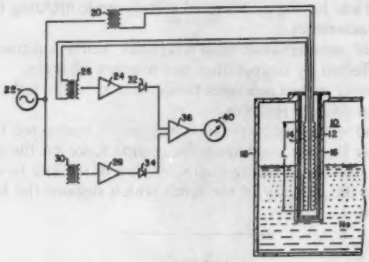
adjustable stop means attached to and translating with said stem for selectively varying the travel of said stem through said mounting flange thereby permitting the insertion flowmeter apparatus to be used in different sizes of pipeline.

4,152,937
LIQUID LEVEL SENSOR

William H. Todt, Elmira Heights, and Kerwin C. Playfoot, Horseheads, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 10, 1976, Ser. No. 656,912
Int. Cl.[2] G01F *23/26*
U.S. Cl. 73—290 R **6 Claims**

1. In a liquid metal level containment system, a combination of, a container and liquid metal therein, a closed end tubular protective housing extending into the liquid metal and a continuous elongated liquid metal level mutual inductance probe to provide a continuous, substantially linear liquid metal level indication, said probe having a continuous primary winding and a continuous secondary winding wound coextensively about the longitudinal axis of said closed end tubular protective housing, said coextensively wound primary and secondary windings being inserted in the closed end tubular protective housing and isolated from direct contact with the liquid metal contacting the closed end tubular protective housing, the primary and secondary windings of the elongated liquid metal

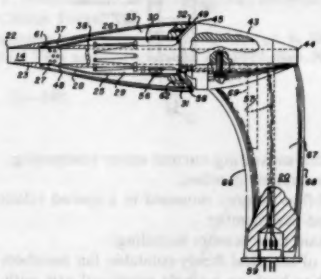


level mutual inductance probe consisting of multiple coil turns, changes in mutual inductance occuring in response to changes in the level of the liquid metal producing an output signal from said secondary winding indicative of the level of liquid metal in said containment, the coil turns per unit length of said coextensively wound primary and secondary windings at either or both ends of said elongated liquid metal level mutual inductance probe progressively increasing over an end portion of said probe toward the end of said probe, the number of coil turns per unit length in said end portion being greater than the coil turns per unit length in the remaining portion of said elongated liquid metal level mutual inductance probe.

4,152,938
AIRCRAFT TEMPERATURE PROBE

Karl Danninger, P.O. Box 3125, Boulder, Colo. 80307

Filed May 19, 1978, Ser. No. 907,835
Int. Cl.[2] G01K *1/08*
U.S. Cl. 73—349 **8 Claims**



1. A fluid stream data probe, comprising:

(a) a probe housing having an axial bore therethrough, said bore having forward and rearward open ends respectively at forward and rearward ends of the housing for conveying fluid therethrough;

(b) the forward end of the housing surrounding said forward bore opening being knife-sharp for resisting ice formation thereon;

(c) the outer surface of the housing increasing in diameter

rearwardly along said axial bore to a portion of maximum width;

(d) the housing forming a radially outwardly and rearwardly extending channel therein having an intake orifice in the bore wall and an outlet orifice in the outer surface of the housing near said portion of maximum width for conveying a portion of the fluid from the bore through said channel;

(e) a sensor element carried in said channel; and

(f) means for mounting the probe in the fluid stream.

4,152,939

MICRO-SAMPLING DEVICE

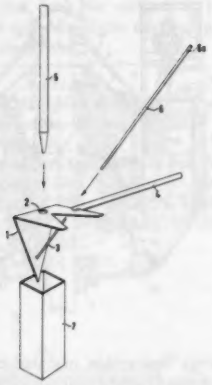
Alan Renshaw, Clinical Research Centre, Division of Clinical Chemistry, Watford Rd., Harrow, Middlesex HA1. 3UJ, England

Filed Feb. 1, 1977, Ser. No. 764,537

Claims priority, application United Kingdom, Feb. 2, 1976, 4072/76

Int. Cl.[2] G01N *1/10*

U.S. Cl. 73—425.4 R **10 Claims**



1. A micro-sampling device for accurately measuring a desired volume of a micro-sample of a fluid, comprising:

(1) specimen container means for containing a specimen of said fluid to be sampled, said specimen container means having a capillary bore extending longitudinally thereof and having an open end through which said fluid is received into said capillary bore by capillary action;

(2) support means; and

(3) solid probe means angularly disposed on said support means for accurately displacing a desired measured volume of said fluid from said specimen container means upon threadedly placing said capillary bore open end onto said probe means, said support means being selectively positionable in relation to a separate collection means;

whereby the extent to which said capillary bore open end is placed onto said probe means controls the volume of fluid displaced from the capillary bore to give said desired measured volume of fluid.

4,152,940

VIBRATION DETECTOR

Makoto Saito, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

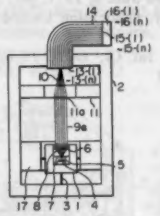
Filed Oct. 11, 1977, Ser. No. 841,116

Claims priority, application Japan, Oct. 15, 1976, 51-122900; Dec. 25, 1976, 51-155676; May 9, 1977, 52-52128

Int. Cl.[2] G01P *15/08*

U.S. Cl. 73—653 **8 Claims**

1. A vibration detector comprising a stationary housing, a pendulum vibratably mounted in said housing, a bundle of optical fibers fixed vertically on said pendulum and having a light receiving plane on the upper cross section of the same, a beam sensor having a plurality of cells arranged on said pendulum, a light source mounted in said housing for illuminating said upper section of said fibers, an optical means for focusing



the light beam from said light source on said optical fibers, and each cell of said beam sensors being arranged to provide an electrical signal according to the point that the light beam illuminates depending upon the vibration of said pendulum.

4,152,941

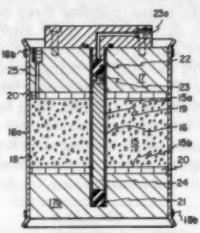
PROCESS FOR MEASURING THE FRACTURE TOUGHNESS OF ROCK UNDER SIMULATED DOWN-HOLE STRESS CONDITIONS

Ahmed S. Abou-Sayed, and Arfon H. Jones, both of Salt Lake City, Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Filed May 8, 1978, Ser. No. 903,962

Int. Cl.[2] G01N *3/12*

U.S. Cl. 73—799 **5 Claims**



1. A process for measuring the fracture toughness of rock under simulated downhole stress conditions including the steps of,

preparing a section of rock appropriately to have a cylindrical shape and a center longitudinal bore formed therethrough producing thereby a thick walled specimen;

longitudinally prenotching that longitudinal bore appropriately such that, when sufficiently pressurized, specimen fracture will occur at said prenotching to bisect said specimen;

arranging said specimen appropriately between end caps that will deform minimally when subjected to pressurization, closing off thereby said longitudinal bore;

lining said longitudinal bore with fluid tight jacket,

pressurizing internally said longitudinal bore and incrementally raising that internal pressure until specimen fracture occurs;

applying confining pressure to said specimen simultaneously to apply internal pressurization thereto, which internal and confining pressures are maintained at a constant ratio until specimen fracture occurs;

measuring the maximum pressure within said longitudinal bore at the time of specimen fracture; and

calculating from the measured maximum pressure, the specimen fracture toughness taking into account the specimen geometry.

4,152,942

INERTIAL PLATFORMS

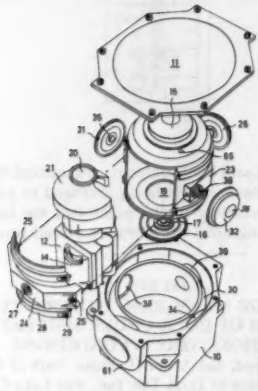
David Anderson, Edinburgh; Kenneth R. Brown, Kirknewton, and William L. Linklater, Penicuick, all of Scotland, assignors to Ferranti Limited, Hollinwood, England

Filed Jun. 8, 1977, Ser. No. 804,793

Claims priority, application United Kingdom, Jun. 11, 1976, 24379/76

Int. Cl.[2] **G01C** *19/02, 19/28*

U.S. Cl. 74—5 R **5 Claims**



1. An inertial platform which includes a frame, a plurality of gyroscopes and a plurality of accelerometers secured to reference surfaces on the frame to define three mutually orthogonal reference axes, an outer casing, three gimbals supporting the frame in the outer casing for movement about four axes, an intermediate one of the gimbals being capable of only limited movement, a pickoff and a torque motor located on and operative about each gimbal axis and including bearing means defining said axes, the intermediate gimbal and an adjacent gimbal having portions joined by a bearing which gimbal portions are removable to permit removal of the gyroscopes and accelerometers secured to the frame.

4,152,943

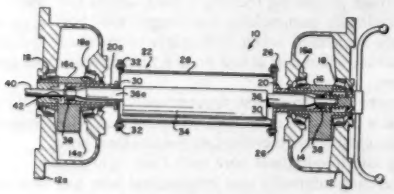
VIBRATORY MECHANISM

Geoffrey F. Wall, Carlisle, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 24, 1978, Ser. No. 880,775

Int. Cl.[2] **F16H** *33/10*

U.S. Cl. 74—87 **20 Claims**



1. A vibratory mechanism, especially for use with an earth-compacting drum, comprising:

a plurality of separate weight means which have eccentric-throw portions;

means supporting said weight means for rotation about a rotary axis, in spaced-apart locations with said eccentric-throw portions substantially radially aligned; and

means coupling said weight means together for rotation in common; wherein

said coupling means comprises resilient means for sustaining and reactively absorbing forces and loads arising from parallel and angular misalignments and rotary and axial displacements of said weight means relative to one another, and rigid shaft means axially interposed between said weight means, with said resilient means interpositioned between, and fixed to, said shaft means and each one of said weight means and further including means engaged with at least one of said weight and coupling means for imparting rotation thereto.

4,152,944

PISTON TYPE ENERGY CONVERSION MACHINE

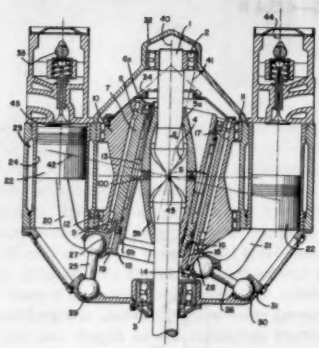
Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Division of Ser. No. 706,204, Jul. 9, 1976, abandoned. This application Jul. 26, 1977, Ser. No. 819,168

Claims priority, application France, Jul. 12, 1976, 76-21299

Int. Cl.[2] **F16H** *15/16, 23/00, 1/28;* **F02B** *75/26*

U.S. Cl. 74—191 **18 Claims**



1. An energy conversion machine comprising a frame, a torque transmitting member supported by said frame for rotation about a first axis, means including a piston to define a working fluid chamber on said frame, said piston being reciprocable on a second axis, transmission means drivably interconnecting said piston and said torque transmitting member and including a nutatable member having interior rolling surfaces of revolution about a third axis intersecting said first axis at an angle to establish a point of axes intersection, said third axis being revolvable in a biconical path about said first axis, said torque transmitting member having exterior rolling surfaces of revolution about said first axis and in rolling frictional engagement with said interior rolling surfaces at two points of contact on opposite sides of said point of axes intersection, an arm-like extension having one end connected to said nutatable member and another end connected pivotally at a fulcrum point to said piston, said fulcrum point lying in a plane perpendicular to said third axis and passing through said point of axes intersection.

4,152,945

POWER TRANSMITTING MECHANISM

Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Division of Ser. No. 706,204, Jul. 19, 1976, abandoned. This application Jul. 26, 1977, Ser. No. 819,402

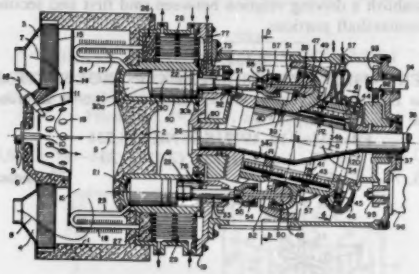
Claims priority, application France, Apr. 21, 1976, 76 11753

Int. Cl.[2] **F16H** *15/16, 23/00, 1/28;* **F02B** *75/26*

U.S. Cl. 74—191 **11 Claims**

1. A mechanical power transmitting apparatus having a frame, a rotary output shaft supported by the frame on a first axis, a plurality of reciprocable pistons located in the frame symmetrically about the first axis, and means to transmit power from the pistons to the output shaft characterized by: a mobile

bed plate supported by the frame for swashing movement about a point on the first axis, a cylindrical extension connected to said bed plate and having an axis also intersecting said point, a pair of oppositely convergent cone-like rolling surfaces on the first axis, connected for rotation with the output shaft and



symmetrically located with respect to said point, and closed circular rolling surfaces carried by said cylindrical extension for engagement with said cone-like surfaces at two contact points movable toward and away from said point on the first axis in equal distances therefrom.

4,152,946

TRANSMISSION DEVICES

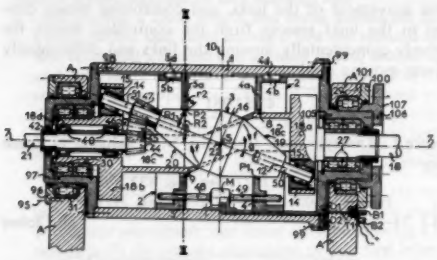
Yves Kemper, Maisons-Lafitte, France, assignor to Vadetec Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 598,625, Jul. 24, 1975, abandoned. This application Jul. 19, 1976, Ser. No. 706,291

Claims priority, application France, Jul. 22, 1975, 75 22847; Aug. 1, 1975, 75 24130; Apr. 21, 1976, 76 11753; Jul. 12, 1976, 76 21298; Jul. 12, 1976, 76 21299

Int. Cl.[2] F16H *15/16, 15/08*

U.S. Cl. 74—193 **69 Claims**



1. A transmission device comprising a frame, drive input means, drive output means, and means interconnecting said input and output means including a first element having a first axis fixed relative to the frame, and a second element rotatable about a second axis intersecting said first axis at a point thereon, said second element being driven conically about said point on the first axis and circumferentially of said first axis, said first element having a pair of rolling surfaces disposed about said first axis one each side of the plane passing through the point of intersection of said axes and perpendicular to said first axis, said second element having a pair of rolling surfaces disposed about said second axis, one each side of the plane passing through the point of intersection of said axes and perpendicular to said second axis, rolling surfaces of one of said elements being the surfaces of cones having an apex half-angle substantially equal to the angle of intersection of said first and second axes, a gyroscopic action of said second element producing a couple bringing respective rolling surfaces on said first and second elements into rolling engagement at two points located one each side of the plane passing through the point of intersection of said axes and perpendicular to said first axis.

4,152,947

METHOD AND APPARATUS FOR CONTROLLING AN INFINITELY VARIABLE TRANSMISSION

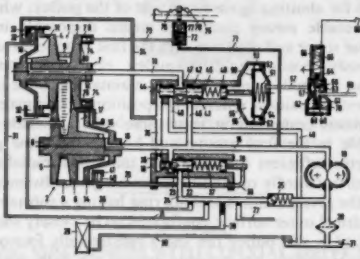
Petrus H. van Deursen, Deurne, and Hemmo H. J. Ludoph, Heeze, both of Netherlands, assignors to Van Doorne's Transmissie B.V., Netherlands

Filed Feb. 2, 1977, Ser. No. 765,054

Claims priority, application Netherlands, Feb. 9, 1976, 7601286

Int. Cl.[2] F16H *55/52*

U.S. Cl. 74—230.17 F **27 Claims**



11. An infinitely variable transmission comprising, in combination, first and second V-shaped pulleys, an endless transmission member disposed between the pulleys, each of the pulleys comprising a pair of facing, coaxially rotatable conical discs, a first conical disc of each pulley being fixedly connected to a shaft, respectively identified as first and second shafts, first and second cylinder-piston units associated respectively with the first and second pulleys, each of the cylinder-piston units having a hydraulic cylinder and a piston, the axial position of the second conical disc of each pulley being controllable with respect to the first conical disc by the hydraulic cylinder-piston unit associated with said pulley, pumping means for supplying hydraulic fluid to said cylinder-piston units, a first control valve for controlling fluid pressure in one of the cylinders of the first and second cylinder-piston units to control the tension in the endless transmission member, and a second control valve for regulating the fluid supply to and discharge from the other cylinder to control the transmission ratio.

4,152,948

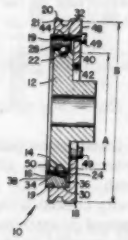
DEVICE FOR INCREASING DIAMETER OF A PULLEY

Kenneth LiDonnici, 433 E. 56th St., New York, N.Y. 10022

Filed Sep. 28, 1977, Ser. No. 837,086

Int. Cl.[2] F16H *55/36, 55/52*

U.S. Cl. 74—230.16 **7 Claims**



1. A device, for use with a pulley having a substantially cylindrical outer surface with a first circumferential belt groove therein having side walls and defining a first pitch diameter, for increasing the pitch diameter to a desired second pitch diameter, said device comprising:

a. a pulley rim having a substantially cylindrical inner surface configured to be received around the pulley and a substantially cylindrical outer surface having a second circumferential belt groove therein defining the desired second pitch diameter, wherein the diameter of the inner surface of the pulley rim is greater than the diameter of the

outer surface of the pulley to defne an annular space therebetween having a given width;

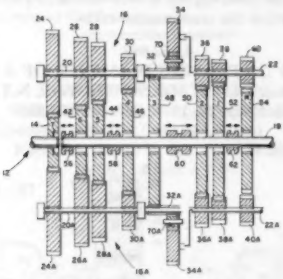
b. means for releasably clamping the pulley rim concentrically around the pulley to mount same thereon thereby increasing the pitch diameter of the pulley to the second pitch diameter comprising a radial flange extending inwardly from one side of the pulley rim and means seatable in the first groove and coative with only the side walls thereof to clamp the pulley against the radial flange, wherein the radial flange extends inwardly from one side of the pulley rim and has a length greater than said given width for abutting against one side of the pulley, wherein the seatable means comprises means disposable in the annular space and coactive with the first groove for simultaneously positioning the pulley rim concentrically around the pulley and releasably maintaining same in the concentric position, wherein the positioning and maintaining means comprises at least three spherical balls each seatable in the first groove and having the same given diameter sufficient to project the outermost radial point thereof outwardly of the first groove a given distance less than the given width, a locking ring having a substantially cylindrical outer surface configured to be closely slidably received in said pulley rim and a substantially frustoconical inner surface positionable around the balls with the narrower cross-sectional end facing the radial flange, wherein the narrower cross-sectional end has a thickness less than the distance between the outermost radial point of the balls and the inner surface of the pulley rim and the wider cross-sectional end has a thickness greater than the distance between the outermost radial point of the balls and the inner surface of the pulley rim and means for adjustably biasing the locking ring towards the flange to wedge the locking ring between the balls and the pulley rim.

4,152,949

EXTENDED RANGE TRANSMISSION

John R. Vandervoort, Richland, and Alan R. Davis, Plainwell, both of Mich.

Filed Apr. 18, 1977, Ser. No. 788,479
Int. Cl.[2] F16H *3/08*
U.S. Cl. 74—331 **15 Claims**



1. A change gear transmission comprising:

an input shaft having an input gear supported thereon for rotation therewith;

a mainshaft generally coaxial with said input shaft;

at least one compound countershaft having an axis of rotation substantially parallel to the axis of rotation of said mainshaft, said countershaft having a plurality of countershaft gears supported thereby for rotation therewith, one of said countershaft gears in constant meshing engagement with said input gear to establish a driving relation between said input shaft and said countershaft;

a plurality of mainshaft gears surrounding said mainshaft for free rotation relative thereto, each of said mainshaft gears being constantly meshed with one of said countershaft gears; and

means to selectively clutch said mainshaft gears one at a time to said mainshaft to establish a driving relation between said countershaft and said mainshaft;

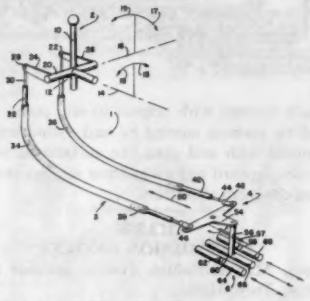
said compound countershaft comprising a first portion carrying said countershaft gear constantly meshed with said input gear and a second portion, a countershaft gear on said first portion and a countershaft gear on said second portion each being constantly meshed with an idler to establish a driving relation between said first and second countershaft portions.

4,152,950

DIFFERENTIAL AND PUSH-PULL CONTROL SYSTEM

William D. Langford, Stow, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed May 10, 1977, Ser. No. 795,534
Int. Cl.[2] G01M *1/168;* **G01P** *3/20*
U.S. Cl. 74—471 XY **23 Claims**



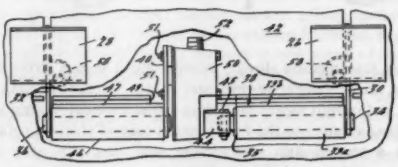
1. Differential push-pull control apparatus comprising a controlled device, plural push-pull links connected to the controlled device at spaced connections, support means connected to the device for supporting movement of the device in a first mode upon paired coincident movement of the links and movement of the device in a second mode upon differential relative movement of the links, and controlling means connected to the links remote from the controlled device for selectively coincidentally moving the links and differentially relatively moving the links.

4,152,951

CONTROL MECHANISM

Lawrence L. Korczykowski, Hamburg, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 12, 1977, Ser. No. 832,270
Int. Cl.[2] G05G *1/14, 11/00;* **F16K** *31/62*
U.S. Cl. 74—474 **10 Claims**



1. A control mechanism for a vehicle of the type including a hydraulic motor arranged to perform a control function with respect to the vehicle, said mechanism including:

A. first and second manual control members mounted adjacent the operator's station of the vehicle for rotation about a common axis;

B. a housing mounted upon one of said control members for rotation therewith;

C. actuation means disposed within said housing and mounted to said second control member for rotation therewith independent of the rotation of said housing;

D. means within said housing operative in response to relative rotation between said housing and actuation means to generate an electrical signal generally proportional in magnitude to the degree of such relative rotation; and

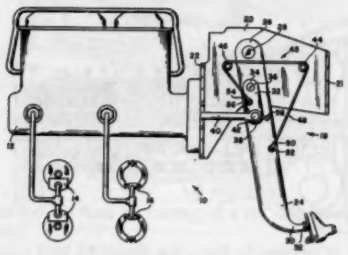
E. means operative in response to receipt of said electrical signal to control the output of said hydraulic motor in proportion to said electrical signal; whereby the vehicle performs the desired control function with respect to the vehicle.

4,152,952

BRAKE PEDAL LINKAGE MECHANISM

Keith H. Fulmer, Mishawaka, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 19, 1977, Ser. No. 861,791
Int. Cl.[2] G05G *1/04*
U.S. Cl. 74—517 **3 Claims**



1. A linkage mechanism for moving an output member at a variable rate in response to uniform movement of an input member, comprising:

a housing;

a first lever having a first end pivotally attached to said housing and a second end;

a second lever pivotally attached to said first lever;

a push rod pivotally attached to said second lever;

sheave means attached to said housing; and

a cable having a fixed length and being connected to said sheave means, said cable having a first end secured to said first lever and a second end secured to said second lever, said first lever moving in an arc about said first end in response to an input force applied to said second end of the first lever, said first end of said cable moving with said first lever causing changes in the length of cable between said first and second ends of the cable and the sheave means, the change in cable length between the sheave means and said second end of the cable causing the second lever to rotate on said first lever and provide said push rod with linear movement, said linear movement being a function of both the arcuate movement of said first lever and the rotative movement of said second lever.

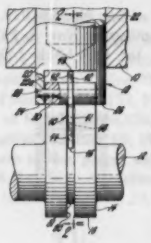
4,152,953

ROLLER CAM FOLLOWER WITH ANTI-ROTATION DEVICE

David B. Headley, Eaton Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 15, 1977, Ser. No. 860,955
Int. Cl.[2] F16H *53/06*; F01L *1/06*
U.S. Cl. 74—569 **2 Claims**

1. A cam and cam follower mechanism including a rotary cam having a follower lifting cam surface with an annular slotted groove in the outer periphery thereof, a reciprocably guided follower having one end thereof bifurcated to provide spaced apart arms extending from a lower end surface thereof, a cam follower roller means rotatably supported by said follower with said roller means positioned between said legs for rolling engagement with said cam surface, and an anti-rotation plate means having an arcuate notch at one end of a radius corresponding to the radius of said annular groove, at its opposite end a surface conforming in shape to said lower end surface, and a through aperture bearing portion intermediate its ends of a diameter so as to slidably encircle said cam follower roller means whereby said anti-rotation plate means is supported by said cam follower roller means in position to having



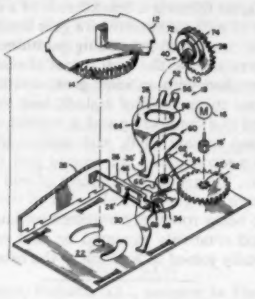
said one end with said arcuate notch of said anti-rotation plate means slidably received in said annular groove whereby to prevent rotation of said follower.

4,152,954

TIMING MECHANISM WITH COAXIAL DRIVE SYSTEM

Garry A. Stout, Bargersville, and Benjamin F. Chestnut, Indianapolis, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Mar. 21, 1977, Ser. No. 779,313
Int. Cl.[2] G05G *1/00, 3/00*
U.S. Cl. 74—575 **4 Claims**



1. A timing mechanism comprising:

(a) a housing including a plate,

(b) a cam means supported by said housing,

(c) a motor, including an output pinion, secured to said housing,

(d) a series of teeth circularly arranged and coupled to said cam means, and,

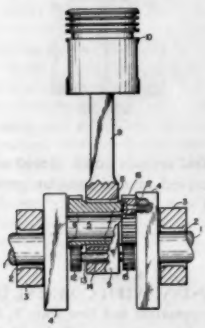
(e) coupling means coupling said output pinion to said teeth comprising:

1. a no-back pawl pivotly mounted in said slideably carried by said plate, a distal end of said no-back pawl engaging said teeth, and a first aperture in said no-back pawl.

2. a drive pawl slideably carried by said no-back pawl, a distal end thereof engaging said teeth, and an opposite end including engagement means engaging guide means extending from said no-back pawl, and a second aperture in said drive pawl in line with said first aperture, and

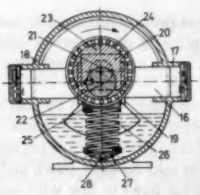
3. a gear means coupled to said output pinion having a hub portion extending through said first and second apertures and rotatably engaging said plate providing a rotational axis for same, and a drive portion carried by said gear means eccentric to said rotational axis and engaging said drive pawl through said second aperture.

4,152,955
ENGINE COMPOUND CRANKSHAFT
Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610
Continuation-in-part of Ser. No. 538,019, Jan. 2, 1975, Pat. No. 3,957,338. This application Nov. 5, 1975, Ser. No. 628,917
Int. Cl.[2] A01K 7/00
U.S. Cl. 74—602 5 Claims



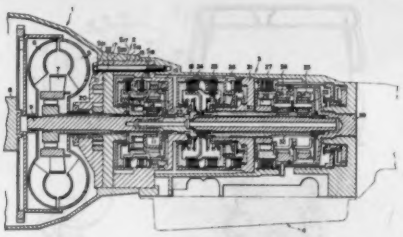
1. An engine block, a plurality of longitudinally aligned main bearings in said engine block, longitudinally spaced main bearing shafts journaled in said main bearings, arms fixed on the adjacent ends of said main bearing shafts, a crankpin joining adjacent said arms forming a crankthrow of a crankshaft having a plurality of such crankthrows, a gear fixedly mounted on one of the said arms, said gear being positioned eccentrically upon said arm relative to the axial center of said crankpin, said gear being emeshed with an idler gear, said idler gear being fixedly attached to one end of a shaft, said shaft being rotatively mounted in a connecting rod, a second idler gear being fixedly attached to said shaft, said second idler gear being emeshed with a second gear, said second gear fixedly attached to an eccentric, the geometrical center of said gear being axially aligned with the geometrical center of the said eccentric, said eccentric being rotatively mounted on said crankpin said connecting rod rotatively mounted on said eccentric at one end and pivotally joined to a piston at the other end.

4,152,956
COMPRESSOR FOR AIR-CONDITIONING DEVICES FOR VEHICLES
Rudolf Hintze, Lessingstr. 32, 6056 Heusenstamm, Fed. Rep. of Germany
Filed Aug. 8, 1977, Ser. No. 823,003
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2638001
Int. Cl.[2] F16F 15/32
U.S. Cl. 74—603 12 Claims



1. An improved compressor in the circuit of an air-conditioning device for vehicles being driven by the vehicle engine, said compressor having a rotatable crankshaft, in which said improvement comprises means for storing the densification terminal pressure force; and means operative for utilizing said stored force for diminishing and distributing the torque moment peaks generated and for overcoming the torque moment during the densifying compaction.

4,152,957
AUTOMATIC TRANSMISSION WITH AN OVERDRIVE MEANS
Kazuaki Watanabe; Koujiro Kuramochi, and Kiyoshi Ohnuma, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Apr. 27, 1977, Ser. No. 791,576
Claims priority, application Japan, Dec. 1, 1976, 51-144926
Int. Cl.[2] F16H 57/02
U.S. Cl. 74—606 R 10 Claims



1. An automatic transmission comprising a fluid torque converter, an overdrive means and an auxiliary reduction gear means, said overdrive means having a planetary gear mechanism and a housing which circumferentially encloses said planetary gear mechanism over substantially the entire axial length thereof and which presents an axially continuous cylindrical outer peripheral surface concentric with the central axis of said transmission, said torque converter and auxiliary gear means having individual housings including a rear and front end connecting portion respectively, said rear end connecting portion of said torque converter housing presenting a cylindrical inner peripheral surface concentric with the central axis of said transmission and engaged over substantially the front half of said cylindrical outer peripheral surface of said overdrive means, said front end connecting portion of said auxiliary gear mechanism presenting a cylindrical inner peripheral surface concentric with the central axis of said transmission and engaged over substantially the rear half of said cylindrical outer peripheral surface of said overdrive means, wherein said fluid torque converter, said overdrive means and said auxiliary gear means are assembled together so that the torque convertor and auxiliary reduction gear means are self-aligning when said rear and front end connecting portions are engaged over the housing of said overdrive means.

4,152,958
FLUID JET CUTTING OF ROLLS OF MATERIAL
Clayton Bogert, Glen Rock, N.J. 07452
Filed Mar. 14, 1977, Ser. No. 777,495
Int. Cl.[2] B23B 1/00, 5/14
U.S. Cl. 82—47 32 Claims

1. Fluid jet cutter arrangement for cutting a roll of material in situ comprising

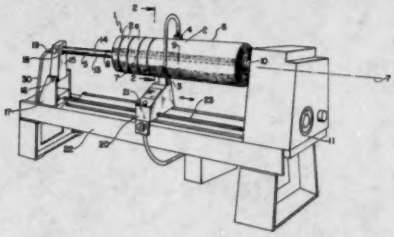
fluid jet cutter means including a fluid jet nozzle,

support means for operatively relatively rotationally supporting removably a roll of material to be cut in situ in a position along an axis in radially inwardly disposed relation to the nozzle for relative rotational movement between the roll of material and the nozzle about the axis upon rotationally driving one of such roll and nozzle relative to the other, and further including rotational mounting and drive means for mounting correspondingly one of such roll and nozzle for driven rotation about the axis and relative to the other of such roll and nozzle, and

fluid receiving means operatively disposed radially inwardly

of the position of the roll of material for collecting spent fluid and for maintaining such collected spent fluid out of contact with such roll,

the nozzle being selectively disposed in operatively flow aligned relation to the receiving means at a point along the axis for causing a fluid jet exiting from the nozzle to cut circumferentially into and through the roll of material in situ at such point and be collected by the receiving means during relative rotational movement between the nozzle and the roll of material upon such rotational driving of one of such roll and nozzle relative to the other.



30. Method for fluid jet cutting of a roll of material in situ comprising

rotating a fluid jet nozzle and a roll of material to be cut in situ relatively to each other about an axis with the roll of material in radially inwardly disposed relation to the nozzle while directing a fluid jet exiting from the nozzle at a selective axial point along the extent of the roll of material to cut circumferentially into and through the roll of material in situ, and

collecting spent fluid radially inwardly of the roll of material during such directing of the fluid jet and maintaining such collected spent fluid out of contact with such roll.

4,152,959

HOT SHEARING APPARATUS

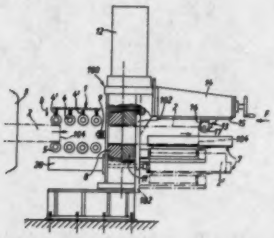
Friedrich W. Elhaus, D-5600 Wuppertal Hofkamp, Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 764,294

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1976, 2604418

Int. Cl.[2] B26D *5/38, 7/06, 5/12, 3/16*

U.S. Cl. 83—123 **11 Claims**



1. A hot shearing apparatus for shearing heated bars in billets, comprising:

a drive unit for advancing the billets;

a fixed shearing ring and a movable shearing ring, said rings each having a diameter to length ratio which is greater than one, and said rings each including two shell halves;

means for spreading the shell halves of the fixed and movable shearing rings in a direction substantially transversely to the shearing motion thereby facilitating movement of the billet into and out of the shearing rings; drive means for producing the shear forces; abutment means for the billets; ejector means for the sheared billets; and transfer means for the sheared billets.

4,152,960

SAWMILL APPARATUS

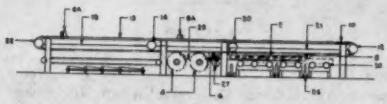
Robert K. Detjen, Eau Claire, Wis., assignor to McDonough Manufacturing Company, Eau Claire, Wis.

Continuation-in-part of Ser. No. 772,152, Feb. 25, 1977, which is a continuation-in-part of Ser. No. 556,836, Mar. 10, 1975, Pat. No. 4,009,632. This application Jun. 10, 1977, Ser. No. 805,553

The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.

Int. Cl.[2] B27B *7/00, 29/08*

U.S. Cl. 83—435.2 **31 Claims**



1. Sawmill apparatus comprising a first endless carrier, a second endless carrier disposed parallel and adjacent to said first endless carrier, a pusher dog supported on said first carrier, a holdback dog supported on said second carrier, first drive means for advancing said first carrier and said pusher dog along a given path to advance a log engaged thereby longitudinally through a saw assembly, said carriers both being on the same side of the log path, means imposing on said second carrier a retarding force resisting movement of a log engaged by said holdback dog in a forward direction along the longitudinal path of the log, and saw means positioned in the path of a log moving through said apparatus, said saw having an infeed side and an outfeed side, said first endless carrier extending from the infeed side of the saw to the outfeed side of the saw, said second endless carrier extending from the infeed side of the saw to the outfeed side of the saw.

4,152,961

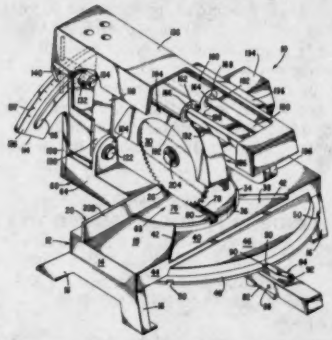
RADIAL SAW

William A. Batson, Pickens, S.C., assignor to The Singer Company, New York, N.Y.

Filed Jan. 18, 1978, Ser. No. 870,534

Int. Cl.[2] B27B *5/20*

U.S. Cl. 83—471.3 **2 Claims**



1. A radial saw comprising:

(a) a table having a work support surface,

(b) a frame connected to the table and disposed under the work support surface,

(c) a post connected to the frame remote from the table,

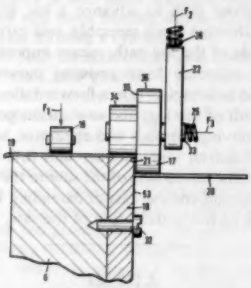
(d) a support arm connected to the post to cantilever over the work support surface,
(e) a pair of support rods, one round and one square, affixed to the support arm,
(f) a slide means holding a pair of bearings,
(g) one of the bearings being formed with a cylindrically shaped bearing surface arranged to embrace the round rod in close fit for sliding motion thereon,
(h) the other bearing being formed with a rectangularly shaped bearing surface arranged to embrace the square rod in loose fit in the direction toward and away from the round support rod and a close fit in the direction perpendicular thereto for sliding motion thereon, and
(i) a saw motor carried by the slide means to be moved therewith in translatory motion across the work support surface.

4,152,962

CUTTING OF PAPER IN A PRINTER

Wolfgang Hendrischk, Neu-Ulm, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,202
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2655832
Int. Cl.[2] B26D *1/20*; B23D *19/02*
U.S. Cl. 83—482 **13 Claims**



1. Device for cutting a web in a printer, comprising:
a stationary bar having two surfaces intersecting at right angles to establish a cutting edge extending transversely to a direction of web advance in the printer; one of the surfaces engaging the web to be cut;
carriage means running along but above said bar;
a cutting roll journalled on the carriage having first and second cylindrical portions respectively of small and large diameter and annular shoulder in between;
means for urging the roll down towards the one surface of this bar so that the shoulder is located adjacent to the other one of the bar surfaces; and means for urging the shoulder laterally against the other bar surface.

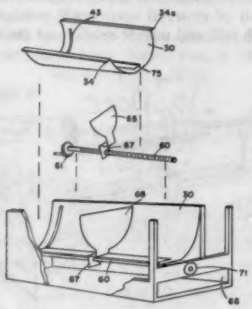
4,152,963

HAND SLICER FOR PREPARED MEATS

Lawrence J. Romanik, 9 Nadine Pl. S., and Robert W. Jones, 979 Bruce Ct., both of Westerville, Ohio 43081

Filed May 9, 1977, Ser. No. 795,330
Int. Cl.[2] B26D *1/10, 4/50*
U.S. Cl. 83—762 **11 Claims**

1. A structure of unitized and interrelated components for slicing uniform portions of a precooked meat comprising:
a six-sided enclosure
a rack having a semi-circular curvature, and means positioning said rack on the base of said enclosure, said rack related in configuration to the outside curvature of said meat,
a push plate initially positioned at one end of said rack,
a stop plate positioned at the opposite end of said rack,
means for advancing said push plate longitudinally relative to said rack to advance the meat in said rack to said stop plate,
a plurality of parallel knife guides comprising a U-shaped member and means positioning said member adjacent said



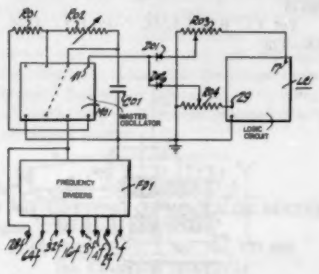
stop plate to cross-sectional retain in position a knife, wherein the spacing between said guides is related to the predetermined slice thickness.
a pair of hinges for hingedly supporting said stop plate whereby when opened said stop plate receives the slice of meat for removal therefrom, and
said six-sided enclosure including a hinged top for completely enclosing said structure.

4,152,964

KEYBOARD CONTROLLED JUST INTONATION COMPUTER

Harold M. Waage, 7T Magie Apts., Faculty Rd., Princeton, N.J. 08540

Filed Oct. 17, 1977, Ser. No. 842,722
Int. Cl.[2] G10H *5/00*
U.S. Cl. 84—1.01 **11 Claims**



1. An apparatus for enabling a keyboard musical instrument to render intervals and chords in all inversions and transpositions with just intonation automatically, said apparatus comprising:
keyboard means for selecting certain notes;
a logic circuit means connected to said keyboard means;
tuning means connected to said logic circuit means, said tuning means having a first and a second input; and,
octavely related tone producing elements connected to said tuning means,
wherein activation of said first input of said tuning means adjusts at least one of said octavely related tone producing elements to sound lower in pitch by a single comma, and
wherein activation of said second input of said tuning

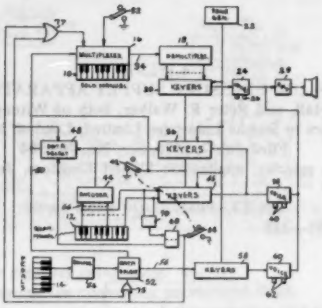
means adjusts at least one of said octavely related tone producing elements to sound lower in pitch by a double comma.

4,152,965

ORGAN CIRCUIT AND METHOD OF OPERATION

Stephen L. Howell, Jasper, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Jul. 8, 1977, Ser. No. 813,833
Int. Cl.[2] G10F *1/00*
U.S. Cl. 84—1.03 **10 Claims**



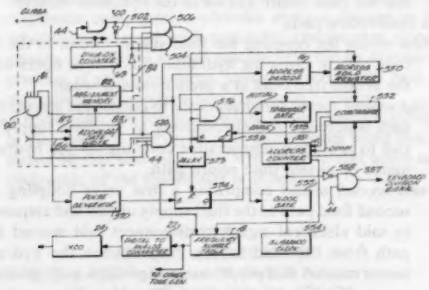
1. In an electronic organ having a keyboard comprising a plurality of playing keys arranged in octaves with corresponding keys in each octave being associated with the same note name, the improvement comprising: note collector means operatively associated with said keyboard for developing a multiple bit binary word wherein the individual bit locations of said word correspond, respectively, to individual groups of said keys associated with a particular note name, said collector means producing a keydown logic level at the bit locations in said word corresponding to a plurality of actuated keys of the corresponding note names anywhere on said keyboard, and encoder means connected to said collector means and responsive to said binary word for producing a respective control signal for each of a plurality of said binary words.

4,152,966

AUTOMATIC CHROMATIC GLISSANDO

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Oct. 6, 1977, Ser. No. 839,915
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.24 **6 Claims**



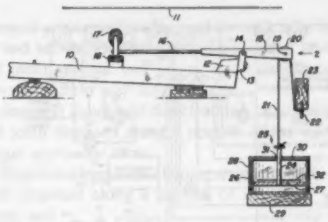
1. A key-operated tone generator having automatic glissando between any two successively operated keys, comprising an oscillator for controlling the pitch frequency of the tone generator, oscillator control means responsive to a series of electrically coded frequency numbers for changing the frequency of the oscillator in steps corresponding to the musical scale, means storing frequency numbers for each step of the musical scale, an accumulator register, a hold register, means responsive to operation of a key for transferring a selected frequency number from said means storing frequency numbers to the hold register and transferring the frequency number in the hold register to the accumulator register, compare means for comparing the frequency number in the hold register and accumulator register, means including a clock for periodically multiplying the contents of the accumulator register by a predetermined constant and storing the product in the accumulator register, means applying the contents of the accumulator register to the oscillator control means to control the pitch of the tone generator, and means responsive to the compare means for interrupting the periodic multiplication when the contents of the accumulator register and hold register are substantially equal.

4,152,967

PNEUMATIC PIANO ACTION

Ellis Barron, 7228 Eads Ave., La Jolla, Calif. 92037

Filed Aug. 25, 1977, Ser. No. 827,697
Int. Cl.[2] G10C *3/16*
U.S. Cl. 84—236 **5 Claims**



1. An action for a keyboard type musical instrument, comprising:

(a) a hammer having a hammer butt and a hammer pivot;

(b) a key-lever;

(c) a piston;

(d) a closed cylinder fixed in the instrument and slideably containing said piston, the combination providing a velocity dependent resistance force; and

(e) means including flexible cord means interconnecting said piston, said hammer butt, and said key-lever such that key-lever motion causes movement of the hammer to strike a musical element in the instrument, said hammer movement acting in opposition to said velocity dependent resistance force.

4,152,968

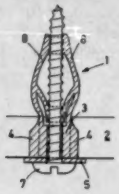
FASTENING PLUG

Guy Lassine, 60, rue de Stalle, 1180 Brussels, Belgium

Filed Dec. 6, 1977, Ser. No. 857,883
Claims priority, application Belgium, Nov. 12, 1977, 0182861
Int. Cl.[2] F16B *13/10*
U.S. Cl. 85—71 **4 Claims**

1. A plug for fastening an object to a wall, which comprises a substantially cylindrical portion with a center bore, ending in a collar which will bear on a surface of said wall, said cylindrical portion being extended by a least two outer wings which are joined at the plug end by a first central member having a central bore therethrough to receive a tightening member, while at least two inner wings extend from interior surfaces of said outer wings at approximately the midlengths thereof to a second central member having a central bore therethrough such that a tightening member screwed into said cylindrical

portion and said first and second central members causes said inner wings to push outwardly against said outer wings to



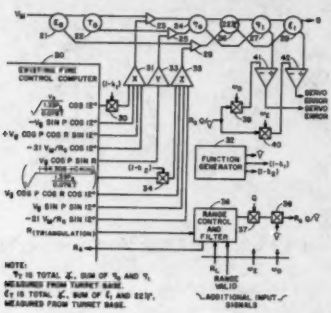
cause said outer wings to distort outwards as an overthickness to thus insure the locking of the plug on the wall.

4,152,969

FIRE CONTROL CORRECTION SYSTEM FOR WIND AND TARGET MOTION

Robert A. Leightner, Arlington, Vt., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,093
Int. Cl.[2] F41G *3/24*
U.S. Cl. 89—41 EA **2 Claims**



1. A fire control system for directing an aircraft mounted gun toward a ground target from an operational point spaced from said gun on said aircraft using a guidance system located on said aircraft at a position remote from both said gun and said operational point comprising:

first azimuth and first elevation gimbal resolver means having inputs and outputs configured to receive and transmit a muzzle velocity signal and mounted on said gun for servo guidance thereof;

second azimuth and second elevation gimbal resolver means having an input connected to said first azimuth and elevation gimbal resolvers respectively and configured to receive and transmit said muzzle velocity signal transmitted thereby and mounted on said guidance system for servo control thereof and having a second input;

third azimuth and third elevation gimbal resolver means mounted at said operational point to direct aim at a selected target on the ground and having inputs and outputs effectively connected to said second azimuth and second elevation gimbal resolvers respectively for receipt of said muzzle velocity signal transmitted thereby and having second inputs;

a computer having a plurality of outputs effectively connected to said second azimuth gimbal resolver means including;

a first output connected to said muzzle velocity signal input of said second azimuthal gimbal resolver,

a second output connected to said second azimuthal gimbal resolver at said second input thereto,

a third output connected to said second elevation gimbal resolver at said second input thereof;

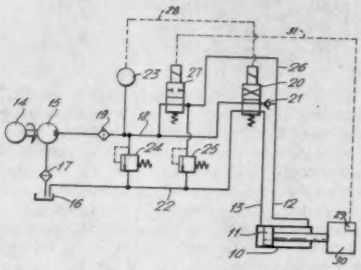
operational amplifier means connected to the outputs of said third azimuth and elevation gimbal resolver means for generating servo error signals to be used in directing said gun, whereby the resolvers are continuously used to control the direction of aim of said gun.

4,152,970

FLUID PRESSURE SUPPLY APPARATUS

Patrick Hall, and Peter F. Walker, both of Witney, England, assignors to Smiths Industries Limited, London, England

Filed Jul. 7, 1976, Ser. No. 703,384
Claims priority, application United Kingdom, Jul. 7, 1975, 28550/75
Int. Cl.[2] F01L *25/04*; F15B *13/04*
U.S. Cl. 91—318 **4 Claims**



1. Hydraulic apparatus comprising:

a hydraulic motor and fluid pressure supply apparatus to control the operation of the hydraulic motor, the fluid pressure supply apparatus comprising a fluid pressure source, a fluid supply circuit to receive pressurized fluid from the fluid pressure source, and a fluid return circuit;

electrical means responsive to operation of said hydraulic motor to derive an electrical signal which is indicative of whether the hydraulic motor has attained a predetermined position;

first and second fluid paths to couple the fluid supply circuit and the fluid return circuit to the hydraulic motor;

a fluid return path;

first means for coupling the fluid supply circuit to the first fluid path to cause the hydraulic motor to be operated by the pressurized fluid in a predetermined sense;

and second means simultaneously to couple the second fluid path selectively and alternatively to the fluid supply circuit to provide a regenerative coupling for the hydraulic motor or to said fluid return path;

said second means comprising a first valve coupling said second fluid path to the fluid supply circuit and responsive to said electrical signal to disconnect said second fluid path from the fluid supply circuit when the hydraulic motor reaches said predetermined position and a pressure-responsive second valve coupled between the second fluid path and said fluid return path and operable during operation of the motor in said predetermined sense to transfer coupling of the second fluid path to said fluid return path whenever the pressure in the second fluid path attains a predetermined value.

4,152,971

FLUIDIC REPEATER

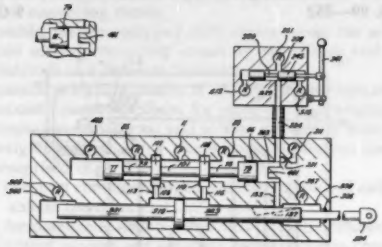
Willie B. Leonard, 5902 Royalton, Houston, Tex. 77036

Division of Ser. No. 521,036, Nov. 5, 1974, Pat. No. 4,046,059, which is a continuation-in-part of Ser. No. 489,829, Jul. 18, 1974, Pat. No. 3,988,966. This application Sep. 3, 1976, Ser. No. 720,420

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.[2] **F15B** *13/16, 15/22*

U.S. Cl. 91—388 **21 Claims**



1. Fluidic repeater comprising:

a fluid passage for conveying pressurized fluid;

first source connection means for connecting said passage to source of pressurized fluid;

transmitter means, including a variably-positionable fluid-flow obstructor, for variably obstructing the flow of fluid from said source connection means to said fluid passage according to the position of said obstructor over a continous range of positions including a first position and a second position and a plurality of positions in between said first and second positions:

a responder having components movable with respect to one another, said components including a primary cylinder and a primary piston axially-movably disposed within said primary cylinder, said passage being connected to one end of said primary cylinder such that the fluid within said passage exerts a first force against the end of said primary piston adjacent to said one end of said primary cylinder;

opposition means for exerting a second force upon said primary piston in opposition to said first force, the total force exerted by said opposition means being independent of the position of said transmitter means obstructor;

feedback means for variably venting fluid from said passage to a reservoir of fluid at lower pressure than said passage at a point downstream from said transmitter means obstructor, the extent of venting by said feedback means being variable according to the respective positions of the responder components, whereby upon a change in the relative position of said responder components due to change in pressure in said passage effected by change of position of said transmitter, said responder feeds back to said passage a counteracting change in pressure;

said transmitter and feedback means controlling the pressure in said passage, said pressure in said passage being free of dither **50** that said responder will come to rest when said obstructor of the transmitter is at rest.

4,152,972

TORQUE APPLICATOR

Tor T. Fylling, Olaf Schous vei 18, Oslo 5, Norway

Filed Mar. 10, 1977, Ser. No. 776,434

Claims priority, application Norway, Mar. 12, 1976, 760872

Int. Cl.[2] **F01B** *3/00*

U.S. Cl. 92—33 **7 Claims**

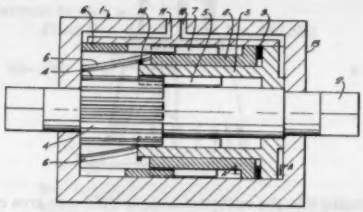
1. A torque applicator which comprises a house which includes an inner wall forming an axial through bore therein;

helical teeth disposed along a portion of the inner wall of said house;

a torque applicator stem rotatably positioned to extend through said through bore in said house;

teeth disposed along a portion of the surface of said torque applicator stem which is positioned within said through bore;

a hydraulic or pneumatic doubleacting piston positioned within said through bore in said house between said inner wall of said house and said torque applicator stem; said piston being axially movable within said through bore, said piston including a head portion which extends between said torque applicator stem and said inner wall of said house and an elongated portion of a smaller dimension;



an element positioned within said through bore in said housing and between said elongated portion of said piston and said inner wall of said house; said element being axially movable within said through bore;

teeth disposed along said doubleacting piston engaging with said teeth disposed along a portion of the surface of said torque applicator stem;

teeth disposed along said element engaged with said helical teeth disposed along a portion of the inner wall of said house; and

teeth means between said head portion of said piston and said element which is functional to alternatively engage or disengage in a positive fashion said piston and said element.

4,152,973

HEAT ENERGY HOMOGENIZER

Fred M. Peterson, 3232 Shawnee Trail, Fort Worth, Tex. 76135

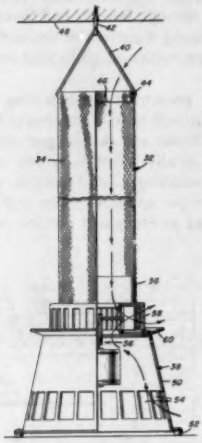
Filed Sep. 16, 1977, Ser. No. 833,969

Int. Cl.[2] **F24F** *13/02*

U.S. Cl. 98—33 A **14 Claims**

1. For use in a room including a floor and ceiling, and an intermediate occupant zone vertically between the floor and ceiling; air homogenizer means for equalizing the temperature within said occupant zone, said homogenizer means comprising a single vertical air passage duct having opposite ends constituting upper and lower ends positioned respectively adjacent the ceiling and floor of the room, a first air inlet means located at the upper end of the air passage duct adjacent the room ceiling, second air inlet means located at the lower end of the air passage duct adjacent the room floor, and air outlet means positioned at an intermediate point along said single vertical air passage duct between the upper and lower ends and between the first and second air inlet means and at a height along said air passage duct so as to discharge into the occupant zone of the room, and power means for drawing air through said first and second air inlet means and vertically through said air passage duct toward said air outlet means, comingling the

air from the first and second air inlet means at said air outlet means, and discharging the comingled air through the air



outlet means into the occupant zone to define an area of stable air.

4,152,974

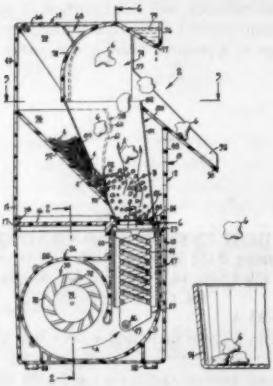
HOT AIR CORN POPPER

Lawrence J. Tienor, Eau Claire, Wis., assignor to National Presto Industries, Inc., Eau Claire, Wis.

Filed Jun. 16, 1978, Ser. No. 916,128

Int. Cl.[2] A23L *1/18*

U.S. Cl. 99—323.8 **20 Claims**



17. A corn popping apparatus, which comprises:

(a) a body;

(b) means located in the body for producing an upwardly directed flow of hot air;

(c) a hollow popping vessel located in the body in the path of the hot air flow, the popping vessel having an open upper end and a lower end which is closed by a perforated grill, the perforations of the grill being smaller than the size of unpopped corn kernels such that the grill supports unpopped corn kernels in the path of the hot air flow, whereby the unpopped corn kernels are popped and carried upwardly by the hot air flow through the popping vessel, the popping vessel further having a front wall which is slanted rearwardly toward a rear wall of the popping vessel, the slanted front wall of the popping vessel coacting with the hot air flow to induce a circular rotating motion in the unpopped corn kernels, and

(d) means for feeding unpopped corn kernels onto the grill of the popping vessel.

4,152,975

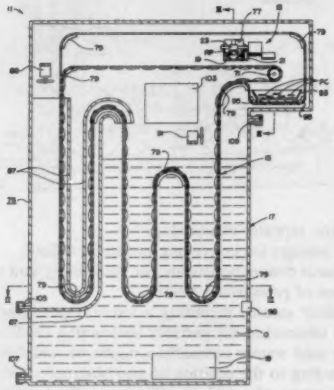
POTATO CHIP APPARATUS

John R. Jones, 3676 Old Street Ct., Memphis, Tenn. 38118

Filed Nov. 5, 1976, Ser. No. 739,309

Int. Cl.[2] A47J *37/12*

U.S. Cl. 99—352 **9 Claims**



1. An apparatus for processing potato chips, said apparatus comprising: slicer means for cutting thin potato slices from a raw potato, conveyor means for receiving said thin potato slices as they are cut by said slicer means for conveying said thin potato slices along a vertically formed sinuous path, said conveyor means including a first portion for receiving said thin potato slices and a second portion for covering said first portion after said thin potato slices have been received thereon to loosely trap said thin potato slices therebetween, said first portion including a plurality of pocket-like members for loosely receiving said thin potato slices, reservoir means for containing a quantity of cooking oil, heater means for heating said quantity of cooking oil, means for force spraying said thin potato slices being conveyed by said conveyor means with said heated cooking oil whereby said thin potato slices are cooked, a first dryer means for substantially drying said thin potato slices prior to said thin potato slices being force sprayed with said heated cooking oil, and a second dryer means for substantially drying said thin potato slices after said thin potato slices have been force sprayed with said heated cooking oil.

4,152,976

AUTOMATIC WEIGHING AND DISTRIBUTING APPARATUS FOR TOPPING SLICED CHEESE, ETC. ON PIE CRUSTS

Koichiro Kawasaki, Tanashi; Kazushige Okada, Matsudo; Yutaka Suginaka; Tokuichi Adachi, both of Higashimuragama, and Akira Shirasu, Yokohama, all of Japan, assignors to Meiji Nyugyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 811,443

Claims priority, application Japan, Jul. 2, 1976, 51/87612[U]

Int. Cl.[2] A21C *9/04*

U.S. Cl. 99—450.1 **10 Claims**

1. An apparatus for topping a succession of regularly spaced pizzapie crusts on a conveyer with sliced edible material, said apparatus comprising:

first conveying means for carrying a succession of blocks of

topping material of predetermined shape and size, said first conveying means being driven intermittently;

slicing means located at the outlet end of said first conveying means and rotatable at constant speeds for cutting each block of topping material into slices of predetermined shapes and sizes, said slicing means having a plurality of protruded cutters on the side thereof opposite said outlet end of said first conveying means and at right angles to the direction of movement of said first conveying means;

second conveying means located below said slicing means for receiving said sliced materials from said slicing means, said second conveying means being intermittently driven, speed-changeable and operatively associated with said first conveying means;

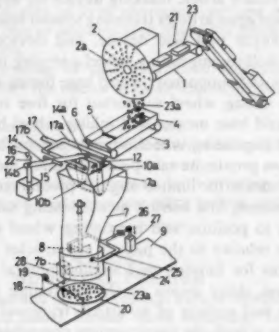
rotatable, feather-equipped shaft means across the width of said second conveying means for smoothing said sliced materials to a constant thickness;

automatic weighing means at the end of and beneath said second conveying means for receiving and weighing the topping material from said second conveying means, said weighing means being electromagnetically operated and comprised of:

a two-part container hinged together at one end and openable at the other end,

a ferromagnetic member attached to each container part,

pivotted support and weighing member means connected to said container for supporting said container and



weighing the amount of said material in said container; and

electromagnetic attracting means on said support and weighing member means for attracting said ferromagnetic members on said container means, whereby when said ferromagnetic members are attracted by said attracting means, container parts pivot at the hinge and the container is opened;

a vertical casing means open at the top and the bottom, located beneath said two-part container, for directing the fall of material from said container when it is open;

stirring blade means within said vertical casing means for separating and distributing said material falling through said casing means;

air supply means at the top of said container for supplying a blast of air against the inside of said container to remove said pieces of said material which might adhere thereto;

third conveying means located below said casing means for carrying a succession of regularly spaced pie crusts to be topped with said sliced material;

a solenoid-operated annular guide means movable up and down around the bottom of said casing means selectively closing the space between the bottom of said casing means and said third conveying means;

stopping means adjacent said third conveying means for stopping a pie crust in position immediately below the bottom opening of said casing means;

electrically actuated first switch means adjacent said pivotted support and weighing member means, series connected to said electromagnetic attracting means and said annular guide means, and operated by movement of said support and weighing member means for actuating said electromagnetic attracting means and said annular guide means; and

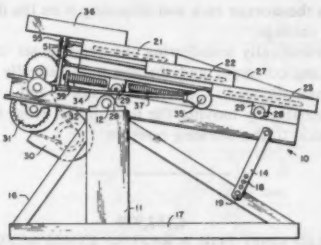
electrically actuated second switch means adjacent to said third conveying means for sensing the presence of a pie crust and actuating said stopping means to stop said crust in position beneath said casing means.

4,152,977

STEMMING AND PEELING APPARATUS

Louis P. Lazzarini, San Jose, Calif., assignor to Genevieve I. Hanscom, Robert Magnuson and Lois J. Thompson, as Trustees of the Estate of Roy M. Magnuson, all of San Jose, Calif., part interest to each

Filed Dec. 5, 1977, Ser. No. 857,383
Int. Cl.[2] A23N *15/02*
U.S. Cl. 99—640 **6 Claims**



1. Apparatus for stemming and peeling produce such as cherries and tomatoes comprising, in combination:

a plurality of beds of parallel adjacent stemming rolls, said beds being positioned side-by-side to carry produce introduced at the upstream side across the beds in consecutive order in a downstream direction normal to the axis of rotation of the rolls;

means for moving said beds back and forth in a direction parallel to the desired path of movement of the produce from the upstream side to the downstream side;

means for effecting rotative movement of said rolls with adjacent rolls being rotated in opposite directions so that the produce in being introduced on the upstream bed will progress in the downstream direction with the back and forth movement of the beds with the adjacent rolls catching and pulling the stems and peel therefrom; and

means mounting said beds with each downstream bed positioned slightly below the next adjacent upstream bed so the produce will tumble and roll as it falls from bed to bed thereby increasing the rolling action of the produce.

4,152,978

METHODS AND APPARATUS FOR CHANGING DIES IN A PRESS AND STOCKING THEM

Haruhisa Abe, Sagamihara, and Mikio Yonekura, Hatano, both of Japan, assignors to Amada Company, Ltd., Isejara, Japan

Filed Aug. 31, 1977, Ser. No. 829,424
Claims priority, application Japan, Aug. 31, 1976, 51/103090
Int. Cl.[2] B30B *15/02*
U.S. Cl. 100—35 **8 Claims**

1. A method of changing dies in a press having a work table including a waiting position, a working position and a retiring position, comprising the steps of:

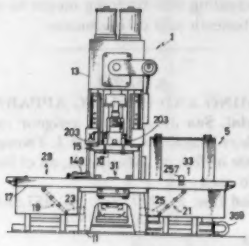
(a) automatically moving a die-set from the working position to the retiring position;

(b) automatically disposing the die-set on a return conveyor

and moving it from the retiring position towards a die transferring carriage positioned at the rear of the press;

(c) automatically disposing the die-set on the die transferring carriage and thereon automatically transferring it to a storage rack positioned adjacent thereto;

(d) selecting a new die-set and automatically removing it



from the storage rack and disposing it on the die transferring carriage;

(e) automatically transferring the new die-set to a die advancing conveyor and thereon automatically advancing the new die-set to the waiting position; and

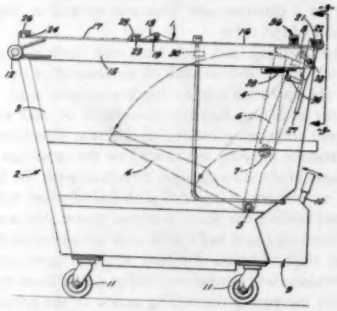
(f) automatically moving the new die-set from the waiting position to the working position.

4,152,979

LID UNIT FOR A REFUSE COMPACTOR

Lewis W. Schmidt, Rio Vista, Calif., assignor to Blackwelders, Rio Vista, Calif.

Filed Jun. 12, 1978, Ser. No. 914,788
Int. Cl.[2] B30B *1/32, 15/00;* F16P *7/00*
U.S. Cl. 100—53 **15 Claims**



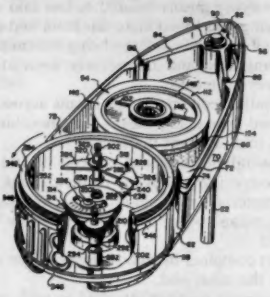
1. A lid unit, for a refuse compactor including a bin having a power-actuated compacting blade therein, comprising a flat, dual section lid supported on the bin in normally closing relation thereto, the lid embodying a front section and a rear section, means transversely hinging the front section and rear section at adjacent edges, the lid being longitudinally shiftable a limited distance on the bin to different selective positions, instrumentalities provided between the bin and lid arranged to prevent opening of either of the lid sections when the lid is in one position, to permit the front lid section only to be opened when the lid is in a second position, and to permit the rear lid section to be folded onto the front lid section and the folded-together sections swung to depend in front of the bin when the lid is in a third position, and means to shift the lid to said selective positions.

4,152,980

ROTARY MARKING DEVICE FOR SUCCESSIVELY IMPRINTING INFORMATION UPON CONVEYED ARTICLES

Burton L. Siegal, Skokie, Ill., assignor to Kiwi Coders Corporation, Wheeling, Ind.

Filed Feb. 10, 1977, Ser. No. 767,630
Int. Cl.[2] B41F *17/26*
U.S. Cl. 101—35 **36 Claims**

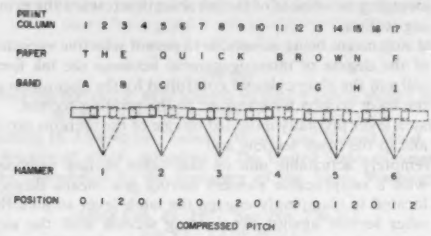


1. In a rotary article marking device for applying imprinted information upon articles traveling spaced apart along the path of a conveyor past said device, said device including base means, a hollow imprinting wheel carrying imprinting means thereupon and supported on said base means for rotary movement, an inking wheel supported for free rotary movement relative said base means, said inking wheel being engageable with said imprinting wheel, support means for mounting said base means proximate said path, mounting means for securing said base means for limited angular pivotal rotation about said support means, first biasing means biasing said base means in said path to position said imprinting wheel into intercepting condition relative to the path of the articles to be imprinted, stop means for limiting said angular pivotal rotation of said base means, drive means on the imprinting wheel positively engaging said surface of an article frictionally to rotate said imprinting wheel; the improvement comprising, means within said imprinting wheel for placing said imprinting wheel in a given initiate rotational orientation prior to interception of an article, said last mentioned means comprising a spring-biased sun and planet arrangement mounted fully within the imprinting wheel, said sun and planet arrangement defined by a stationary circumferentially grooved sun disc mounted eccentrically at the axis of rotation of the imprinting wheel, a circumferentially grooved planet wheel secured to the interior of said imprinting wheel for movement along a generally circular path about said sun disc with the rotation of the imprinting wheel and endless spring means looped about said sun disc and planet wheel, a stationary latch member and said sun disc secured thereto at a point eccentric to the center of said sun disc, a pawl member secured within said imprinting wheel at a location diametrically opposite to the location of said planet wheel and being movable along said circular path simultaneous with movement of said planet wheel and a spring biasing said pawl member to intercept said stationary latch member, the spacing relationship between said sun disc and planet wheel being selected to enable said endless spring means to exert a torque upon the imprinting wheel positively to engage said latch member at the initiate orientation and to maintain said engagement in positive latch-pawl engagement at said initiate orientation and further operable automatically to return said imprinting wheel to said initiate orientation upon release of said imprinting wheel from the article subsequent to application of an imprint, said return being substantially independent of the extent of rotation of said imprinting wheel.

4,152,981
DUAL PITCH IMPACT PRINTING MECHANISM AND METHOD

Anthony P. Sapino, Rochester; Donald S. Swatik, New Baltimore; Robert E. Costello, Utica; Vahe H. Malakian, Sterling Heights, and Kenneth Staugaard, Rochester, all of Mich., assignors to Computer Peripherals, Inc., Rochester, Mich.

Filed Jun. 3, 1977, Ser. No. 803,322
Int. Cl.[2] B41J *9/12*
U.S. Cl. 101—93.01 **50 Claims**

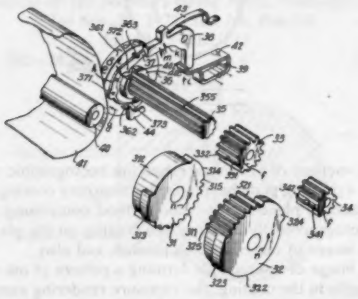

PRINT COLUMN
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
PAPER
T H E Q U I C K B R O W N F
BAND
A B C D E F G H I
HAMMER
1 2 3 4 5 6
POSITION
0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2
COMPRESSED PITCH

1. A method of printing characters in print columns at one or another character pitch, comprising the step of:
providing a plurality of type character carrying members, each having one or another type character pitch defining indicia thereon;
conditioning printing of said characters dependent upon detecting either the one or another character pitch defining indicia;
receiving printing data in serial order;
comparing said printing data with characters on one of said type character carrying members; and
causing printing of said characters with printing means in accordance with said character pitch indicia detected.

4,152,982
MINIATURE PRINTER

Hitoshi Mikoshiba, and Chikao Tezuka, both of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Suwa, both of, Japan

Filed Jul. 21, 1977, Ser. No. 817,778
Claims priority, application Japan, Jul. 21, 1976, 51-86750
Int. Cl.[2] B41J *1/44*
U.S. Cl. 101—93.22 **22 Claims**

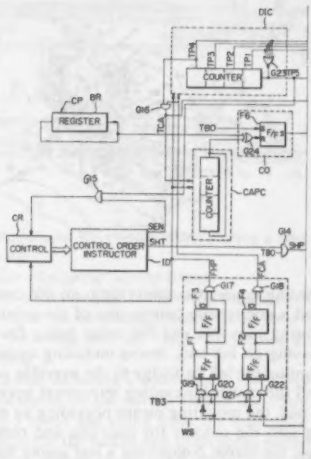


1. A miniature printer for printing a web of paper comprising a rotatable drive shaft; a plurality of character wheels rotatably mounted on said drive shaft, each of said character wheels having a plurality of characters disposed about its periphery; means for selecting a single said character on each of said character wheels for printing on said paper, and for resetting said character wheels to a reset position after printing, said selecting and resetting means including means for selectively coupling said drive shaft and each said character wheel, and means for rotating said drive shaft during selection of a character and resetting of said character wheels, said rotating means being gear means adapted to rotate said drive shaft at a first rotary speed during said character selection and at a second rotary speed different from said first rotary speed during said resetting of said character wheel; and means for effecting printing of said selected characters on said paper between such selection and resetting.

4,152,983
PRINTING HAMMER DRIVING SYSTEM

Shigeru Toyomura; Hiroshi Kyogoku, both of Kawasaki, and Mitsuaki Seki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 692,016, Jun. 1, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,373
Claims priority, application Japan, Jun. 9, 1975, 50-69329
Int. Cl.[2] B41J *1/32*
U.S. Cl. 101—93.23 **7 Claims**



1. A printer comprising:
a type drum having types disposed on its outer periphery so that the types of a like character are staggered to assume different positions spaced circumferentially along the surface of the drum;
a plurality of printing hammers provided oppositely to the types on said type drum;
a group of hammer drivers for driving said plurality of hammers;
a group of AND gates, each having two input terminals and a single output terminal, each of the output terminals being connected to one of said hammer drivers;
a series-input and parallel-output type of shift register having a single input terminal and a plurality of output terminals for storing coincidence signals as printing digit information on selected of said hammers, each of the plurality of output terminals being connected to one of the two input terminals of said respective AND gates;
selector means connected to the other of the input terminals of said AND gates for selecting the staggered types of a like character on the drum;
means including a wave shaper for producing character pulses corresponding to the rotation of said type drum;
a character pulse counter connected to receive and count the character pulses to produce a resultant count;
storage means for storing a plurality of digits of printing information;
a single coincidence circuit responsive to the printing digit

information from said storage means and the count from said character pulse counter for comparing the printing digit information digit by digit with the count of said character pulse counter to produce, upon coincidence therebetween, a coincidence signal and for applying each such coincidence signal to the single input terminal of said shift register while shifting the contents of said shift register upon each digit comparison; and

a controller responsive to said selector means for enabling said shift register to store and shift the coincidence signals as the printing digit information.

4,152,984

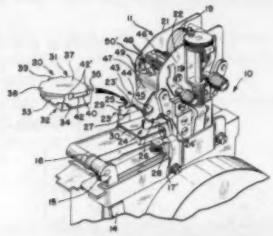
INKING MECHANISM FOR PRINTING APPARATUS

William F. Utzinger, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 698,990, Jun. 23, 1976, abandoned, which is a continuation of Ser. No. 502,479, Sep. 9, 1974, abandoned. This application Jun. 23, 1977, Ser. No. 809,485

Int. Cl.[2] B41F *1/42*

U.S. Cl. 101—292 **14 Claims**



1. Printing apparatus, comprising: an ink cartridge, a print head and a cooperable platen, one of the print head and the platen being movable and the other being fixed, a traveling inker having an ink pad, means including open-sided cutouts for mounting the ink cartridge to the movable one of the print head and the platen for canting movement upon contact with the ink pad, the mounting means providing an entrance throat opening into the cutouts for inserting and removing the ink cartridge, the throat comprising a leaf spring having a curved portion, the leaf spring being deflectable to open the throat while the cartridge is being inserted or removed, the curved portion contacting the ink cartridge to allow the ink cartridge to cant in any plane during cooperation with the ink pad.

4,152,985

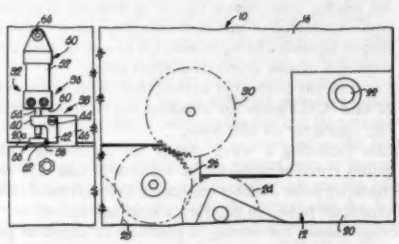
HOLD-DOWN CLAMP ASSEMBLY FOR UPPER SWINGABLE INKER OF PERFECTING PRESS

Ronald D. Welborn, Emporia, Kans., assignor to Didde-Glaser, Incorporated, Emporia, Kans.

Filed Dec. 7, 1977, Ser. No. 858,099

Int. Cl.[2] B41L *27/38;* **B41F** *31/36*

U.S. Cl. 101—352 **7 Claims**



1. In a printing press having a printing section provided with a pair of opposed, upright frame members rotatably supporting at least a plate cylinder, and an inker section operably associated with the printing section provided with opposed, upright frame members supporting at least an ink form roll for rolling engagement with the plate cylinder, said inker section being pivotally mounted on the printing section for swinging movement relative thereto in a direction to move the ink form roll out of operable engagement with the plate cylinder, the combination with said printer and inker sections of:

interengageable stop means on the frame members of the printing section and inker section respectively for limiting swinging movement of the inker section toward the printing section,

said stop means being adjustable to permit selective variation of the degree of interengagement between the ink form roll and the plate cylinder controlled by the disposition of the inker section with respect to the printing section;

a latch lever pivotally mounted on one of the sections proximal to the other section; and

a remotely actuatable unit on said other section provided with a reciprocable element having jaw means thereon located to clampingly engage the latch lever to lock the inker section against the printing section with the stop means interengaged when the element is adjacent one end of its path of travel and regardless of the adjusted positions of the stop means,

said element having means operable to contact said one section when shifted toward the opposite end of its path of travel and effect shifting of the inker section through an arcuate displacement sufficient to move the ink form roll at least slightly out of engagement with the plate cylinder.

4,152,986

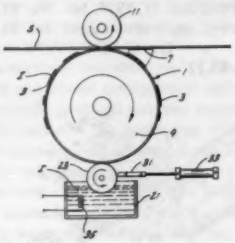
METHOD AND APPARATUS FOR PRINTING RAISED INK IMAGES

Gilbert F. Dadowski, 104 Lee Ridge Dr., Corapolis, Pa. 15108; Robert J. Mahr, 1207 Allire Ave., Monaca, Pa. 15061, and Stanley P. Drachman, 1430 Beech St., Atlantic Beach, N.Y. 11509

Continuation of Ser. No. 747,242, Dec. 3, 1976, abandoned. This application May 12, 1978, Ser. No. 905,374

Int. Cl.[2] B41L *11/14, 27/06, 27/08;* **G03F** *7/02*

U.S. Cl. 101—463 **11 Claims**



1. The method of printing a raised ink hectographic master, utilizing a printing plate having a photosensitive coating which has a generally plane surface, said method comprising:

A. photographically exposing the coating on the plate to

(1) an image of material to be printed, and also

(2) an image of a screen for forming a pattern of ink cells in intaglio in the coating, the exposure rendering removable those portions of the coating around areas of the coating corresponding to the areas of the material to be printed, and also rendering removable those portions of the coating within said areas corresponding to said pattern of ink cells while enabling retention of the said areas of the coating as raised printing areas on the plate;

B. processing the exposed plate to remove said removable portions of the coating, including the ink cell portions, thereby forming said raised printing areas in relief on the

plate with each of said areas having a generally plane surface constituted by a portion of the original plane surface of the coating and with a multiplicity of ink cells in intaglio in each said area corresponding to said pattern;

C. applying a non-volatile solvent transferable hectographic ink to said raised printing areas in sufficient amount not only to fill said ink cells but also to cover the said surfaces of said raised printing areas; and

D. bringing the inked plate and a master substrate into engagement with one another for transfer not only of the hectographic ink on the said surfaces of the raised printing areas but also for transfer of at least some of the hectographic ink in the ink cells to the substrate, thereby to form raised hectographic ink images on the substrate.

4,152,987

IMPERMEABLE POLYMER BOMB LINER FOR USE WITH TNT CONTAINING EXPLOSIVES

Norman H. Lundstrom, Auburn, Wash., and Russell Reed, Jr., Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 18, 1977, Ser. No. 770,247
Int. Cl.² F42B *25/14*
U.S. Cl. 102—6 **10 Claims**

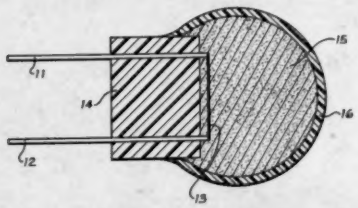
1. As an article of manufacture, a bomb casing having an inner surface to which is directly attached a smooth coating of polyvinylidene chloride, said coating being impervious to trinitrotoluene.

4,152,988

ELECTRIC MATCH WITH EPOXY COATED FLUOROCARBON CONTAINING PYROTECHNIC COMPOSITION

Davey S. Haas, Bloomington, and Claude D. Helton, Springville, both of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1977, Ser. No. 834,218
Int. Cl.² F42B *3/12*
U.S. Cl. 102—28 M **1 Claim**



1. An electric match comprising,

an electric assembly having first and second lead-in wires and a bridgewire connected across the ends of said lead-in wires,

a pyrotechnic composition covering said bridgewire comprised, by weight, of between 52 and 56 percent of atomized magnesium, between 28 and 32 percent of polytetrafluoroethylene and between 14 and 18 percent of fluorocarbon rubber, and

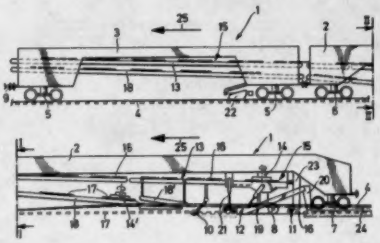
a waterproof coating covering said pyrotechnic composition, said waterproof coating being the reaction product of about 65 percent, by weight, of a liquid epoxy and about 35 percent, by weight, of an epoxy hardener.

4,152,989

MOBILE APPARATUS FOR CONTINUOUSLY LAYING TIES

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft, m.b.H., Vienna, Austria

Filed Oct. 25, 1977, Ser. No. 845,388
Claims priority, application Austria, Feb. 23, 1977, 1210/77
Int. Cl.² E01B *27/11, 29/05*
U.S. Cl. 104—2 **20 Claims**



1. A mobile apparatus for continuously laying a succession of ties, comprising

(a) a bridge-like elongated carrier frame,

(b) at least one undercarriage supporting the carrier frame,

(c) an arrangement for excavating ballast from a bed and for smoothing the ballast bed, the ballast excavating arrangement including

(1) a chain guide including a transversely extending guide section mounted on the carrier frame, the chain guide enclosing a space and rising from the transverse guide section adjacent the ballast bed to an upper portion, and

(2) an endless ballast excavating chain supported for movement in the chain guide, and

(d) means for conveying and laying the succession of ties in a position extending transversely to the carrier frame, the tie conveying and laying means having a path extending through the space enclosed by the chain guide.

4,152,990

MOBILE TRACK TIE TRANSPORT APPARATUS

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 25, 1977, Ser. No. 844,638
Claims priority, application Austria, Nov. 5, 1976, 8249
Int. Cl.² B65G *7/12*
U.S. Cl. 104—6 **8 Claims**

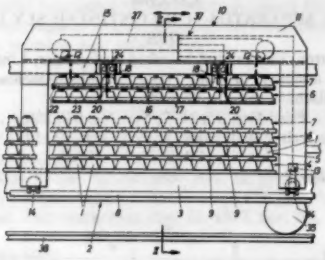
1. A mobile apparatus for transporting tract ties, which comprises

(a) a traveling gantry arrangement including a gantry frame having means for receiving, storing and transporting track ties extending in a direction transverse to the direction of track elongation, the track tie receiving, storing and transporting means including

(1) a tie carrier frame mounted for vertical adjustment on the gantry frame,

(2) two tie holding means mounted on the carrier frame in superposed relationship for simultaneously receiving, storing and transporting two superposed layers of said

ties, each of the tie holding means having a pair of tie engaging elements arranged for movement transverse to the direction of track elongation into engagement with respective ones of the ends of the ties in a respective one of the layers, the vertical spacing between the pairs of tie engaging elements corresponding to that of the superposed layers of said ties, and



(3) a separate drive for transversely moving the tie engaging elements of each tie holding means,

(b) a drive for moving the gantry arrangement in the direction of track elongation,

(c) a drive for vertically adjusting the tie carrier frame on the gantry frame, and

(d) a common power source for all the drives.

4,152,991

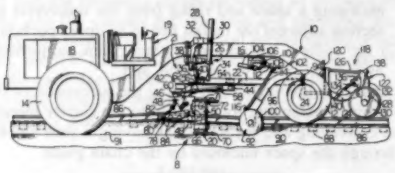
RIPPING APPARATUS

Robert N. Stedman, Chillicothe, and James E. Gee, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 726,394, Sep. 24, 1976, abandoned. This application Jun. 27, 1977, Ser. No. 810,540

Int. Cl.[2] E01B *27/00*

U.S. Cl. 104—7 R **3 Claims**



1. A ripping apparatus, connected to a frame of a vehicle having a longitudinal axis, comprising:

a housing having a bearing assembly therein and defining an upright pivot axis;

a ripper mechanism having an upright shaft member, a lever arm connected to the top of said shaft member, and an elongate ripping element connected substantially to the bottom of the shaft member, said shaft member being pivotally mounted in said bearing assembly of the housing;

linkage means connected between said housing and said frame for raising and lowering said housing while maintaining said upright pivot axis in a substantially vertical condition and said ripping element in a substantially horizontal condition; and

actuator means for rotating said lever arm, said shaft member and said material ripping element about said upright pivot axis, and for automatically swinging said ripping element away from and back toward said longitudinal axis in response solely to preselected elevation of said linkage means.

4,152,992

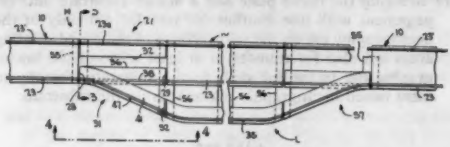
TRACK SWITCHING ARRANGEMENT

Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004

Filed Oct. 31, 1977, Ser. No. 847,066

Int. Cl.[2] E01B *25/06, 25/26*

U.S. Cl. 104—130 **6 Claims**



1. In a transportation system including a primary track interrupted along its length so as to define facing terminal ends, a secondary track spaced transversely of said primary track and having a terminal end adjacent one of said primary track ends, said primary and secondary tracks being in the form of rectangular box beams having rails of circular cross-section mounted on top and side surfaces thereof for engagement with wheel means mounted on an elongated vehicle adapted for travel along said tracks and extending transversely thereof, a track switching arrangement comprising, a pair of first track segments extending between said terminal ends of said primary track, said first track segments being in the form of rectangular box beams and having rails of circular cross-section respectively mounted on top and side surfaces thereof, said rails of said first track segments being respectively aligned with said rails of said primary track for interconnecting said terminal ends thereof, means for shifting said first track segments toward and away from one another for disconnecting and interconnecting said primary track terminal ends, a pair of second track segments extending between said terminal end of said secondary track and the other of said terminal ends of said primary track, said second track segments being in the form of rectangular box beams and having rails of circular cross-section respectively mounted on top and side surfaces thereof, means for shifting said second track segments toward and away from one another between a position wherein the rails thereof are in alignment with said rails of said primary and secondary tracks and a position out of alignment with said rails of said primary and secondary tracks when said first track segments interconnect said primary track terminal ends.

4,152,993

IMPLEMENT COMBINATIONS

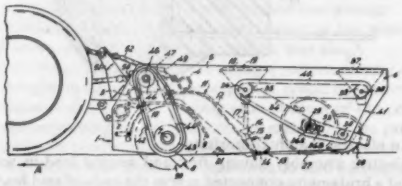
Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Filed Aug. 24, 1977, Ser. No. 827,437

Claims priority, application Netherlands, Aug. 30, 1976, 7609603

Int. Cl.[2] A01C *7/00*

U.S. Cl. 111—8 **12 Claims**



1. An implement combination comprising a frame movable over the ground and a soil working member rotatably mounted on a shaft supported by said frame, said member being rotat-

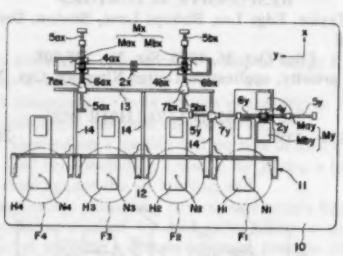
able about an axis defined by said shaft, and said shaft extending horizontally and transverse to the direction of travel, driving means connected to rotate said member forwardly through the soil in the normal direction of travel, a screening hood pivoted to the frame and extending rearwardly over said member to a rear curved portion that rides along the ground and performs a smoothening effect on the ground surface, ground-driven roller means mounted on said frame and positioned to the rear of said hood, a material-dispensing device comprising a hopper in communication with downwardly extending outlet means with openings located in advance of said roller means, said openings being located adjacent and below said curved portion on the rear of said outlet means and the outlet means normally extending below the soil worked by said member to dispense material into the soil during operation, and means for preventing said openings from becoming blocked by soil during the rotation of said soil working member including at least one roller of said roller means journalled to the frame by one-way drive means and said roller being restricted by said one-way drive means to forward movement only with respect to said direction.

4,152,994

FRAME POSITIONING DEVICE FOR AUTOMATIC STITCHING APPARATUS

Jin Sugiyama, Osaka, Japan, assignor to UNITECH Engineering Ltd., Osaka, Japan

Filed Sep. 26, 1977, Ser. No. 836,900
Claims priority, application Japan, Sep. 25, 1976, 51-115258
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.12 **2 Claims**



1. In an automatic stitching apparatus of a type which comprises at least one sewing machine having a stitching needle operable to form an embroidery pattern on a fabric; a worktable for the support of the sewing machine thereon; an embroidery frame for the support of the fabric thereon and adapted to be positioned on said worktable with its plane perpendicular to and in alignment with the direction of movement of said stitching needle; means for holding said frame relative to said stitching needle on said worktable for movement in a predetermined coordinate direction; an X-axis drive mechanism including a plurality of pulse responsive stepping motors mechanically connected to each other to provide an X-axis output drive, each of said stepping motors comprising a circular stator having a plurality of circumferentially angularly spaced poles, a rotor and a plurality of pairs of windings on said pairs of poles and which are energizable in a step-by-step sequence to urge said rotor to move a given angular distance as the energization of said pairs of windings is changed from any one step to the next successive step in said sequence; a Y-axis drive mechanism including a plurality of pulse responsive stepping motors mechanically connected to each other to provide a Y-axis output drive, each of said stepping motors comprising a circular stator having a plurality of circumferentially angularly spaced poles, a rotor and a plurality of pairs of windings on said pairs of poles and which are energizable in a step-by-step sequence to urge said rotor to move a given angular distance as the energization of said pairs of windings is changed from any one step to the next successive step in said sequence; first linkage mechanism means for transmitting the output of said X-axis drive mechanism to said holding means for moving said frame in an X-axis direction; second linkage mechanism means for transmitting the output of said Y-axis drive mechanism to said holding means for moving said frame in a Y-axis direction perpendicular to said X-axis direction; and electric means for applyng a train of pulses to said stepping motors of any one of said X-axis and Y-axis drive mechanisms for affecting angular stepwise movement of the respective said rotors thereof; the improvement wherein:

the respective said rotors of said stepping motors of each of said X-axis and Y-axis drive mechanisms are angularly offset from each other with respect to the axis of rotation thereof at an offset angle of 1/n of the angle of spacing between each adjacent tow of said poles of the respective said stator, wherein n is an integer greater than one and represents the number of said stepping motors for each drive mechanism; and

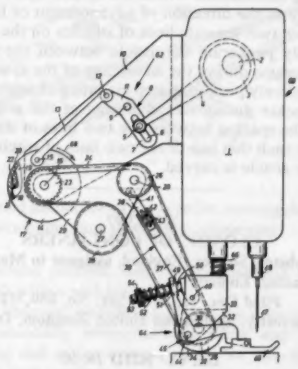
said pulse applying electric means comprises means for applying trains of pulses successively to every adjacent m/2, in the case of m being an even integer, and (m+1)/2, in the case of m being an odd integer, of said pairs of windings of each of said stepping motors, wherein m represents the number of the phases of said windings of each of said stepping motors.

4,152,995

SEWING MACHINE HAVING A DRIVEN FEED ROLLER

Kurt Klundt, Hirschhorn, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,554
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718607
Int. Cl.[2] D05B *27/14*
U.S. Cl. 112—318 **6 Claims**



1. A sewing machine comprising a housing, means mounting a carrier on said housing for upward and downward movement, means biasing said carrier downwardly, a feed roller rotatably supported on said carrier having a periphery adapted to engage the material to be fed, a driving gear wheel rotatably mounted on said housing, a drive shaft connected to said driving gear wheel for rotation therewith, a driven gear wheel connected to said feed roller for rotation therewith, a gear belt engaged over said driving gear wheel and said driven gear wheel for driving said driven gear wheel and said feed roller from said driving gear wheel, a rocker member mounted for pivotal movement on the same axis as that about which said driving gear wheel rotates, first and second spaced apart guide rollers rotatably mounted on said rocker member at spaced locations from said driving gear wheel, said gear belt being guided over said first and second guide rollers and defining an engagement angle over said first guide roller, said belt having

a portion extending between said first guide roller and said driving gear wheel which is substantially horizontal, and a connecting coupling rod connecting said rocker and said carrier, and having a longitudinal axis intersecting the bisector of the engagement angle of the belt over said first guide roller substantially in a horizontal plane extending through the axis of rotation of said rocker.

4,152,996

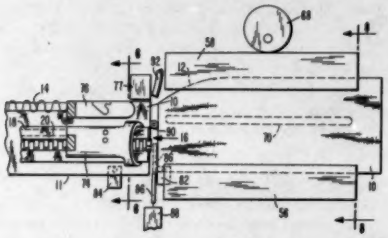
METHOD FOR SEWING TROUSER-FLY UNITS AND THE LIKE

William F. Van Amburg, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Filed Feb. 14, 1977, Ser. No. 768,359

Int. Cl.[2] D05B *19/00, 1/08, 69/10*

U.S. Cl. 112—262.3 **5 Claims**



1. A method of simultaneously sewing two separate lines of stitches on an article with variable spacing between the lines of stitches, the method comprising the steps of

advancing the article through a sewing machine having two sewing mechanisms which are spaced apart transversely relative to the direction of advancement of the article to produce two separate lines of stitches on the article, and

selectively puckering the article between the two sewing mechanisms during the advancing of the article,

said selectively puckering step including changing the size of the pucker during the advancing of the article so as to vary the spacing between the two lines of stitches on the article such that one of the two lines of stitches produced on the article is curved.

4,152,997

CLOSING OF CONTAINERS

George Webster, Shipley, England, assignor to Metal Box Limited, Reading, England

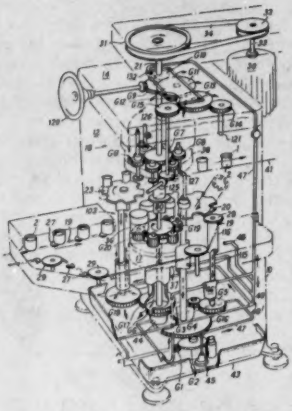
Filed Dec. 12, 1977, Ser. No. 859,751

Claims priority, application United Kingdom, Dec. 15, 1976, 52367/76

Int. Cl.[2] B21D *19/00*

U.S. Cl. 113—24 R **8 Claims**

1. Apparatus for applying end closure members to a succession of container bodies, said apparatus comprising container body support means; end closure securing means above said support means; drive means for driving at least said support means and securing means in simultaneous rotation about a common vertical axis, said drive means comprising a power source and transmission means coupled to said power source whereby to transmit drive from said power source downwardly from above the end closure securing means to all driven working elements of the apparatus; and a single lubricating system comprising oil inlet means connected to an upper part of the apparatus for introducing lubricating oil into the interior of the apparatus in said upper part, oil flow means in and below said upper part for permitting oil, once so introduced, to flow freely and generally by gravity to and then away from each working element of the apparatus requiring introduction of lubricant thereto, the oil flow means further defining oil guiding elements adapted to urge oil centrifugally in the vicinity of some of said working elements, means for applying pressure to oil once introduced into the interior of the



apparatus being absent, and said oil flow means being entirely internal of the apparatus.

4,152,998

METHOD FOR FORMING SNAP-ACTING THERMALLY RESPONSIVE ACTUATORS

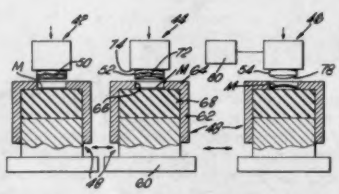
John C. Taylor, Edge Lee, Bishops Lane, Buxton, Derbyshire, England

Filed Oct. 26, 1976, Ser. No. 735,508

Claims priority, application United Kingdom, Oct. 30, 1975, 45023/75

Int. Cl.[2] B21D *53/00;* **H01R** *9/00*

U.S. Cl. 113—119 **26 Claims**



1. A method for the manufacture of a thermally responsive actuator comprising the steps of:

forming an apertured member from a bimetallic sheet the aperture in the member having an arcuate outer perimeter and an inner perimeter, the inner perimeter of the aperture defining a tongue free at one end, the free end of the tongue being juxtapositioned to the outer perimeter of the aperture and the inner and outer aperture perimeters smoothly merging at rounded ends of the aperture adjacent the root of the tongue, th tongue being at least in part generally centrally disposed with respect to the member and the width of that part of the member located in the region of the tongue root measured generally radially from the center of the member being substantially greater than the radial width of the part of the member disposed generally opposite the free end of the tongue;

subjecting the formed apertured member to an initial shaping operation, said initial shaping operation including pressing the member between a die shaped to a domed configuration and an element which acts as an incompressible fluid, said initial shaping operation imparting a con-

tour to the member which extends from the initial plane of the member in a direction which is the reverse of the desired final shape; and

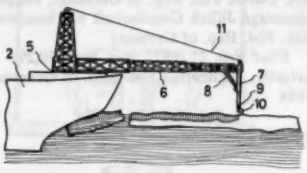
subjecting the member to a further shaping operation, said further shaping operation including pressing said initially shaped member between a die shaped into a domed configuration and an element which acts as an incompressible fluid, said further shaping operation causing the member to conform to the die whereby the member will reverse its curvature with a snap action with a predetermined change in temperature.

4,152,999

ICE-BREAKING APPARATUS FOR SHIPS AND BARGES FOR OPERATION ON ICY WATERS

Masanao Oshima, Tokyo; Hiroshi Tabuchi, Yokohama, and Tsuneo Inokawa, Tokyo, all of Japan, assignors to Mitsui Engineering and Shipbuilding Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,616
Int. Cl.[2] B63B *35/08*
U.S. Cl. 114—42 **7 Claims**



1. An ice-breaking apparatus for a ship or barge for operation on icy waters, comprising:

a turret mounted on a bow portion of the ship or barge;

an extensible arm mounted on said turret;

a head disposed on a leading end portion of said extensible arm, said head including a nozzle for jetting a high pressure fluid against the ice surface; and

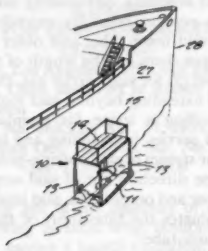
an echo distance measuring device, said nozzle being automatically controlled by said echo distance measuring device to maintain a certain optimum position relative to the ice surface.

4,153,000

FLOATING AIR ERECTING PAINTING PUNT

Chuck A. Henderson, 12300 39th Ave., Kenosha, Wis. 53140

Filed Sep. 6, 1977, Ser. No. 830,594
Int. Cl.[2] B63C *5/00*
U.S. Cl. 114—222 **4 Claims**



1. A painting punt for floating upon a body of water and for securing to the side of a ship comprising:

(a) a horizontal platform adapted to support workmen;

(b) a pair of pontoons that are hollow to permit flotation;

(c) a frame supported by said pontoons;

(d) means carried by said frame to secure said frame directly to the side of said ship;

(e) said frame further including a deck;

(f) an engine driven by a generator, said engine driving a compressor, said engine, generator and compressor all supported by said deck;

(g) said frame further including upward telescoping posts;

(h) said platform defined by a generally rectangular configuration having corners and spaced upwardly from said pontoons;

(i) said telescoping posts operatively connected to said platform at the corners thereof; and

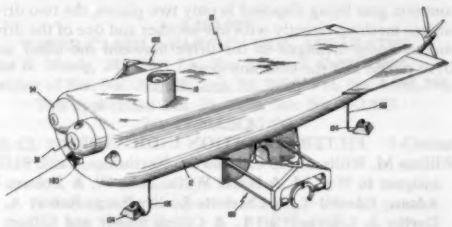
(j) piping means interconnected between said compressor and said posts whereby said posts are extended or contracted to raise and lower said horizontal platform.

4,153,001

MANNED SUBMARINE

Alan R. Krasberg, 24 Devanha Gardens, Aberdeen, Scotland (ABI 2UU)

Filed Apr. 5, 1977, Ser. No. 784,835
Int. Cl.[2] B63G *8/00*
U.S. Cl. 114—312 **15 Claims**



1. In a manned submarine of the type for housing divers at an underwater work-site, said submarine comprising:

a hull;

first and second parallel, side-by-side chambers extending fore-to-aft within said hull;

said first chamber including a first living area maintained at substantially atmospheric pressure and including sleeping and eating compartments for ship-based personnel, and a galley;

said second chamber maintained at greater than atmospheric pressure and including a second living area comprising sleeping and eating compartments for diver personnel; and

passage means interconnecting said first and second chambers enabling ship-based personnel from said first chamber to service diver personnel in said second chamber;

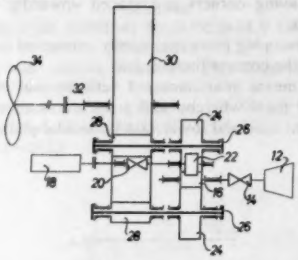
one end of said second chamber comprising a decompression compartment which is separate from said second living area for maintaining pressures different from that of said second living area;

said second chamber including a dive compartment disposed intermediate said decompression compartment and said second living area, said dive compartment including a dive hatch to the exterior of the submarine, and separate passages connecting the dive compartment with said decompression compartment and said second living area.

4,153,002
MARINE GEAR DRIVES

Hans Sigg, Mutschellen, Switzerland, assignor to Maag Gear-Wheel Machine Company Limited, Zürich, Switzerland

Filed Jun. 21, 1977, Ser. No. 808,725
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628572
Int. Cl.[2] B63H *23/32*
U.S. Cl. 115—900 6 Claims

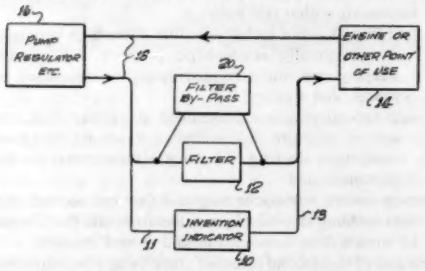


1. A marine gear drive having two main propulsion means and a drive train comprising a respective drive pinion for each said propulsion means, and releasable coupling means between the drive pinions and their respective propulsion means for coupling said drive pinions to their respective propulsion means, each drive pinion being directly connected to the coupling means of its respective propulsion means, a common output gear for coupling the drive to a propeller shaft and drive transmission means for coupling said drive pinions to said common output gear to drive said output gear from the main propulsion means, said pinions, drive transmission means and common gear being disposed in only two planes, the two drive pinions meshing directly with one another and one of the drive pinions being arranged in the drive between the other said drive pinion and the common gear.

4,153,003
FILTER CONDITION INDICATOR

William M. Willis, 19440 Citronia St., Northridge, Calif. 91324, assignor to Wm. M. & Isabel Willis; John W. & Dolores C. Adams; Edward T. & Charlotte L. Bradbury; Robert A. & Dorthy J. Lefevre; Carl L. & Colene Seeley and Gilbert & Dolores D. Contreras

Continuation-in-part of Ser. No. 462,968, Apr. 22, 1974, abandoned. This application Nov. 29, 1974, Ser. No. 528,338
Int. Cl.[2] G01L *7/16*
U.S. Cl. 116—268 23 Claims



1. A pressure differential indicator comprising:

first and second piston means in first and second chambers, respectively,

means to subject said first and second piston means to first and second pressures respectively,

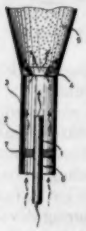
interconnecting means extending into each of said first and second chambers and connected between said first and second piston means, for requiring that the pressure force produced by said first pressure on said first piston means to enable said first piston means to move said first and second piston means together with said interconnecting means be a predetermined amount larger than the pressure force produced by said second pressure on said second piston means to enable said second piston means to move said first and second piston means together with said interconnecting means, and

kicker means provided in said first chamber for sealing off a portion of said first piston means from the pressure in said first chamber to reduce the area of said first piston means subjected to said first pressure when said first piston means is seated therein and only until said first piston means has begun to move said first and second piston means together with said interconnecting means and to thereafter no longer reduce said area, whereby said first piston means moves said first and second piston means together with said interconnecting means with a snap action.

4,153,004
GAS-FEED NOZZLE FOR A PYROLYTIC PARTICLE COATING APPARATUS

Eike Barnert, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Feb. 22, 1977, Ser. No. 770,299
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611844
Int. Cl.[2] B01J *8/24*
U.S. Cl. 118—48 15 Claims



1. A gas feed nozzle apparatus for supplying a decomposable coating-producing gas and a carrier gas to an apparatus for the coating of fuel and/or breeder kernels for use in a nuclear reactor, comprising:

an inner tube (6) the interior of which forms a central channel (1) for supply of said coating-producing gas, said central channel having an end portion of substantially constant cross-section all the way to the exit mouth (9) of said inner tube (6);

an outer tube (3) coaxially surrounding said inner tube (6) and having a portion coaxially extending beyond said mouth (9) of said inner tube, said outer and inner tubes forming between them for the length of their overlap, an annular channel (2) for said carrier gas, the portion of said outer tube (3) extending beyond said mouth of said inner tube (6) providing a space for maintaining a laminar stream of said carrier surrounding and in contact with a central laminar stream of said coating-producing gas flowing in the same direction out of said central channel between said inner and outer tubes, said inner tube having an end that terminates the tube short of the corresponding end of said outer tube;

a container (5) of said coating apparatus having an orifice connected to the exit end of said outer tube;

a constriction (4) of the inner wall of said outer tube located at least in part at said end (8) of said outer tube (3) so as to constitute a nozzle for the end of said outer tube and having a portion of minimum aperture which provides a central opening for exit of gas from said extending portion

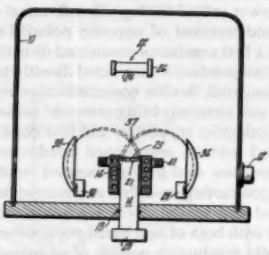
of said outer tube, whereby said coating-producing gas is caused to flow therethrough within a similarly moving sheath of said carrier gas that flushes the surface of constriction, the portion of said container of said coating apparatus immediately above said constriction having an internal cross-sectional area not substantially smaller than that of said outer tube below said constriction.

4,153,005

MULTIPLE ELECTRON BEAM VACUUM VAPOR DEPOSITION APPARATUS

Delwyn E. Norton, Manchester, Conn., and Edward W. Taylor, Richland, Wash., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 6, 1977, Ser. No. 813,397
Int. Cl.[2] C23C *13/12*
U.S. Cl. 118—49.1 **5 Claims**



1. In an electron beam vacuum vapor deposition apparatus wherein a molten pool is heated by electron beam impingement on the pool surface, having a plurality of electron beam sources spaced about the periphery of the molten pool and direct current focusing and deflection means associated with said sources for directing each electron beam onto the pool surface opposite its source, the improvement comprising:

the electron beams crossing paths at some point above the pool, alternating current deflection means disposed around the periphery of said molten pool between said sources and pool for causing each electron beam to impinge on the pool surface along a path shaped as an inwardly curved band relative to its source so that the impingement bands collectively create an approximate toroidal shaped beam heat input pattern at the pool surface, said toroidal heat input pattern being characterized as causing, along a diameter across the surface of the molten pool, a graphical heat intensity curve having maximum peaks located adjacent each end of the diameter with a central minimum valley therebetween.

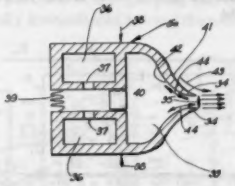
4,153,006

APPARATUS FOR FINISHING MOLTEN METALLIC COATINGS

John A. Thornton, Los Angeles, Calif., and Thomas A. Compton, Butler County, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 568,929, Apr. 17, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,212
Int. Cl.[2] B05C *11/06*
U.S. Cl. 118—63 **6 Claims**

1. A nozzle for use in the finishing of a molten metallic coating on a moving metallic strip, comprising an elongated plenum chamber having a length extending at least the width of the strip being finished, means to supply a gas under pressure uniformly along the length of said plenum chamber, a pair of elongated converging lips communicating directly with said plenum chamber, said lips defining an elongated orifice therebetween of about 0.03 to about 0.20 inch narrow dimension adjacent each end thereof for discharging an elongated jet of said gas under pressure transversely across said strip, the interior surface of said plenum chamber being convexly arcuate and merging smoothly into each converging lip with a radius of curvature substantially equal to the narrow dimension of said orifice, the external surface of said plenum chamber being concave adjacent said lips and merging smoothly thereinto,



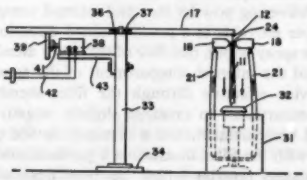
and means to vary the narrow dimension of said orifice progressively from the center thereof outwardly to each end thereof, said interior and external surfaces being so configured that the near-field region of said jet is from 8 to 10 times said narrow dimension of said orifice adjacent each end thereof.

4,153,007

TAPER CANDLE FABRICATION APPARATUS

John B. Menig, 283 Hart Ln., Ben Lomond, Calif. 95005

Division of Ser. No. 695,430, Jun. 14, 1976, Pat. No. 4,096,298. This application Jan. 26, 1978, Ser. No. 872,611
Int. Cl.[2] B05C *5/00*
U.S. Cl. 118—101 **7 Claims**



1. Apparatus for fabricating a plurality of wax candles including a centrally located wick running therethrough, comprising a wick support table, means on said wick support table for retaining a plurality of depending wicks in spaced relation, means for supporting said wick support table permitting table motion thereon, driving means for moving said wick support table in cyclic motion, thereby cyclicly moving the depending wicks past a pouring station adjacent to said wick support table, a container, a heater mounted adjacent to said container for maintaining wax therein in a liquid phase, means for conducting liquid wax from said container to said pouring station, whereby liquid wax is poured on the depending wicks near the tops thereof as they pass said pouring station, to thereafter run toward the bottom of the depending wicks so that a layer of wax solidifies therearound each time one of the depending wicks passes said pouring station, excess liquid wax being thereafter directed to said container, whereby a layered tapered mass of solidified wax collects on the depending wicks, and means for controlling the length of the solidified wax.

4,153,008

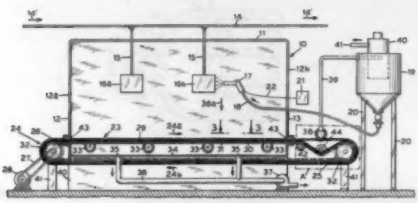
MOVING FILTER SYSTEM FOR AIR-POWDER SEPARATION IN AN ELECTROSTATIC POWDER SPRAY SYSTEM

Frank P. Marino, Cos Cob, and Evert P. Light, Norwalk, both of Conn., assignors to Interrad Corporation, Stamford, Conn.

Filed Apr. 7, 1977, Ser. No. 785,518

Int. Cl.[2] B05B *5/02*; B01D *46/22*

U.S. Cl. 118—634 **3 Claims**



1. A filter belt system for a powder recovery booth or the like, which comprises

(a) a first endless band of heavy mesh-like material trained about spaced supports and forming a support band,

(b) a second endless band of mesh-like material extending about and co-extensive with said first band and forming a filter band,

(c) said filter band being maintained under lengthwise tension in a predetermined plane,

(d) a suction cleaning device engaging said filter band in a predetermined area, and

(e) deflection sprocket means being arranged near said predetermined area, intermediate said spaced supports and below said predetermined plane, whereby said support band is diverted away from the plane of the filter band in said areas by being arranged to pass under the deflection sprocket means, thereby minimizing contact pressure between said filter band and said suction cleaning device.

2. In a powder coating installation, comprising a spray booth provided with an internal compartment, a powder supply container, means operatively associated with said supply container for delivering powder into said internal compartment, a filter member movable in a predetermined direction of travel through the spray booth, one face of said filter member bounding a part of the internal compartment of the spray booth, a suction device effective through the filter member at said internal compartment to create a slightly negative pressure within said compartment, and a cleaning device operatively associated with the filter member in a predetermined area for removing excess powder which has been desposited on the filter member, the improvement comprising

(a) said filter member including a filter layer and an underlying support layer, said layers being in the form of co-extensive endless bands, arranged to occupy the same general plane,

(b) said filter layer being maintained under lengthwise tension,

(c) a pair of spaced rollers for movably supporting said endless bands,

(d) the upper run of said filter layer bounding a portion of said internal compartment whereby excess powder will be deposited on said upper run,

(e) said cleaning device being operatively associated with said upper run, and

(f) means to divert the supporting layer away from the filter layer in said predetermined area comprising deflection sprocket means arranged intermediate said spaced rollers and below said same general plane whereby said supporting layer is diverted out of said same general plane by being arranged to pass under said deflection sprocket means.

4,153,009

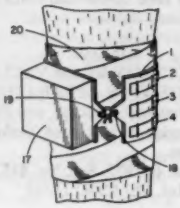
ELECTRIC SHOCK TRAINING DEVICE FOR ANIMALS

William Boyle, 428 Laurel, Romeoville, Ill. 60441

Filed Aug. 8, 1977, Ser. No. 822,735

Int. Cl.[2] A01K *15/00*

U.S. Cl. 119—29 **10 Claims**



1. An electrical shock training device for animals, including an electrical power source having a first terminal of one polarity and a second terminal of opposite polarity at any given instant in time, a first conductor connected directly to said first terminal, a second conductor connected directly to said second terminal, an elongated, flexible non-conductive supporter, said power source and terminals being mounted on said elongated flexible non-conductive supporter, said first conductor including a first bared portion, said second conductor including a second bared portion, said first and second conductors being normally non-conducting, said first and second bared portions being elongated and spaced apart a pre-selected distance to enable contact with both of said bared portions simultaneously by an electrically conductive portion of an animal on which it is used, said conductors becoming electrically conducting when both of said first and second bared portions of said normally non-conducting conductors are contacted simultaneously by said electrically conductive portion of said animal, said elongated, flexible, non-conductive supporter including fastening means to enable affixing said device to a portion of an animal for use thereon.

4,153,010

DEVICE FOR FEEDING ANIMALS

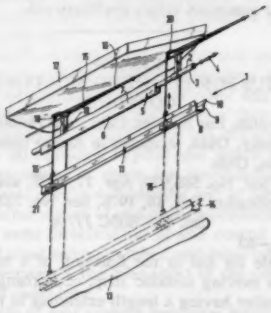
Arthur Erfeling, Cuxhaven, Fed. Rep. of Germany, assignor to Lohmann-Apparatebau GmbH, Cuxhaven, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,225

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652844

Int. Cl.[2] A01K *5/02*

U.S. Cl. 119—52 AF **8 Claims**



1. A device for feeding animals comprising a feed delivery conduit having feed delivery openings in the underside thereof, conveyor means for conveying feed through the conduit, a longitudinal dispensing channel embracing the conduit

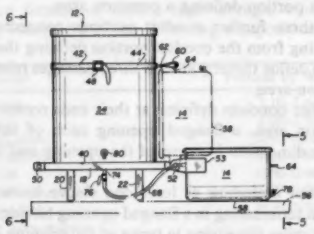
and movable vertically relative thereto, the dispensing channel having downwardly extending flanges which extend below the underside of the conduit, a feed trough disposed vertically below the feed delivery conduit, and means for moving the feed trough vertically between a lower feeding position and an adjustable upper loading position in which the internal bottom surface of the trough engages the lower edges of the flanges of the dispensing channel, whereby the vertical position of the dispensing channel relative to the feed delivery conduit may be varied by adjusting the upper loading position of the trough.

4,153,011

WATER TROUGH ATTACHMENT FOR A HORSE TRAILER

Richard Weissman, 135 Clinton St., Hempstead, N.Y. 11550; Christian H. Haack, 221 Richard Ave., Merrick, N.Y. 11566, and Michael W. Fried, 227-16 Hillside Ave., Queens Village, N.Y. 11427

Filed Oct. 17, 1977, Ser. No. 842,611
Int. Cl.[2] A01K *7/00*
U.S. Cl. 119—72 **4 Claims**



1. A water trough attachment for a horse trailer comprising a trailer-attached support bracket having a T-shape in cross-section, a water tank having a cooperating shaped attachment bracket extending rearwardly therefrom adapted to be slidably disposed over said T-shaped support bracket so as to effectively support said water tank on said horse trailer, and a water trough operatively arranged to be supplied with water from said water tank hingedly connected adjacent one side of said water tank so as to be pivotally traversable between a horizontally oriented position during use and a vertically oriented storage position adjacent said water tank, said water trough having a convexly curved bottom to thereby present a correspondingly curved surface with an optimum nominal wind resistance in said storage position thereof when said horse trailer is in transit.

4,153,012

WASTE HEAT WATERTUBE BOILER

Denis G. Csathy; Wendell L. Y. Hung, both of Minneapolis, and Charles J. Pehoski, St. Paul, all of Minn., assignors to Deltak Corporation, Minneapolis, Minn.

Filed Dec. 19, 1977, Ser. No. 862,024
Int. Cl.[2] F22B *1/18, 9/04*
U.S. Cl. 122—7 R **4 Claims**

1. In a watertube heat exchanger for abstracting heat energy from a hot gaseous medium by circulating a colder liquid medium through the tubes thereof, the improvement which eliminates the problems that result from the presence of tube-sheets as in conventional firetubes heat exchangers, and which improvement comprises the combination of:

A. means defining a gas pass having a medial portion of substantially uniform cross section connecting opposite end portions of larger cross section;

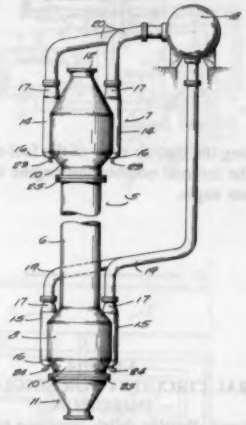
B. means providing an inlet for the gas pass opening into one of said end portions;

C. means providing an outlet for the gas pass that exits from the other one of said end portions;

D. means defining a pair of spaced apart headers joined to each of said end portions of the gas pass, each header having a wall portion that is common to it and to its respective end portion of the gas pass; and

E. the bank of tubes in the gas pass, all but the end portions of each tube in said bank being in said medial portion of the gas pass,

the end portion of each of said tubes being in the larger cross section end portions of the gas pass and being bent laterally outwardly towards and having the extremities thereof



joined to the adjacent one of said wall portions that are common to the headers and the gas pass, so that each tube communicates a header at one end of the gas pass with a header at the other end thereof, whereby the connection of the headers at one end of the gas pass with a steam drum by means of risers and the connection of the headers at the other end of the gas pass with the steam drum by means of downcomers, enables cooling liquid to circulate through the bank of tubes and abstract heat energy from the gaseous medium flowing through the gas pass.

4,153,013

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

Valerio Bianchi, Hochdorf, and Reinhard Latsch, Vaihingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 597,404, Jul. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 564,073, Apr. 1, 1975, abandoned. This application Jul. 11, 1977, Ser. No. 814,611
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1974, 2434743; Apr. 9, 1974, 2417187
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **13 Claims**

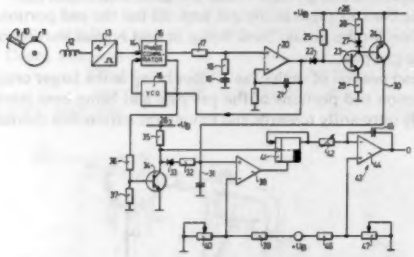
1. A method for controlling the operation of an internal combustion engine, comprising the steps of:

(A) generating a first electrical signal representative of the angular position of a rotating member of the engine, said signal being generated in rpm synchronized time intervals;

(B) generating a second electrical signal by twice integrating the first electrical signal, said second electrical signal being representative of the angular position of an object rotating uniformly at the same rpm as said rotating member of the engine;

(C) measuring the relative phase angle between said first and said second electrical signals, said measurement of the

relative phase angle corresponding to the fluctuations of the mean combustion chamber pressure; and



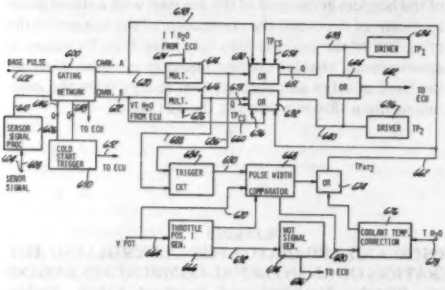
(D) adjusting the fuel-air ratio of the fuel-air mixture admitted to the internal combustion engine in dependence on said phase angle.

4,153,014

PERIPHERAL CIRCUITRY FOR SINGLE-POINT FUEL INJECTION

Charles R. Sweet, Pontiac, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 17, 1977, Ser. No. 778,637
Int. Cl.[2] F02D 5/02
U.S. Cl. 123—32 EA **13 Claims**



1. A control system for controlling the generation of an electrical pulse for energizing an injector and injecting fuel pulses into an internal combustion engine from a source of fuel, said system including a standard electronic control unit for generating a sequence of normal base fuel pulses in response to preselected operating conditions of the engine, including means for adjusting each base pulse, the improvement comprising the steps of adapting the control system to generate a sequence of pulses having a duration greater than the time between subsequent normal pulses including adjusting the base pulses by a preselected function of the normal base pulses which would be generated in response to the engine operating conditions, selectively feeding adjusted base pulses to a multiplier circuit and to an adding circuit, generating a multiplier base pulse after the termination of each said adjusted base pulse fed to said multiplier circuit, said multiplier base pulse bearing a relationship to said adjusted base pulse which is a function of said preselected function, and driving the injector with said sequence of pulses wherein each pulse includes a sequence of an adjusted base pulse and its associated multiplier base pulse.

4,153,015

CARBURETOR ADAPTER FOR MULTICYLINDER ENGINES AND MANIFOLD THEREFOR

Dennis Hampton, 4424 La Mirada Cir., Fair Oaks, Calif. 95628

Filed Jul. 30, 1975, Ser. No. 600,519
Int. Cl.[2] F02B 75/18
U.S. Cl. 123—52 M **5 Claims**

1. A carburetor engine manifold adapter system comprising an adapter having:

a conduit portion defining a common area;

at least three further conduit portions connected to and extending from the conduit portion defining the common area to define thereby at least three passages relative to the common area;

said further conduits defining at their ends remote from the common area, a flanged opening each of substantially similar dimension in terms of the opening and the flange; and

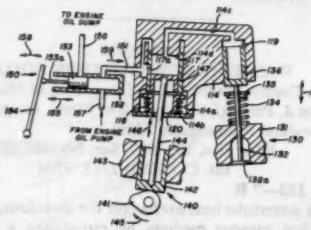
said system including at least one sleeve having a body portion terminating in a flanged opening having a substantially similar dimension in terms of the opening and flange as the ends of said adapter so as to be fastened thereto, and wherein said body portion of said sleeve is of a dimension to snugly receive a corresponding part of a carburetor positioned thereon so that the carburetor is fastened to said adapter by said sleeve.

4,153,016

VALVE CONTROL SYSTEM

Louis A. Hausknecht, 4504 State Rd., Cleveland, Ohio 44109

Division of Ser. No. 791,691, Apr. 28, 1977. This application Jul. 11, 1978, Ser. No. 923,555
Int. Cl.[2] F01L 1/34, 9/02
U.S. Cl. 123—90.15 **3 Claims**



1. Means for controlling the operational event of valves in internal combustion engines, comprising:

(A) a housing having first and second blind bores therein and a first passageway interconnecting said first and second bores;

(B) a cylindrical sleeve slidably received in said first bore and having a radial aperture therein;

(C) a variable hydraulic system;

(D) said housing having a second passageway interconnecting said hydraulic system and said first bore,

(1) whereby hydraulic fluid may be introduced into said housing to control the position of said sleeve therein;

(E) a first piston slidably received within said sleeve and operatively connected to the cam shaft of said engine and being movable in response to movement of the cam shaft to close off said radial aperture of said sleeve and force fluid from said first bore to said second bore; and

(F) a second piston slidably received in said second bore and operatively connected to said valve,

(1) whereby said hydraulic fluid from said first bore may act upon said second piston to open said valve.

4,153,017

ALLOYED CHILLED IRON

Robert C. Behnke, Wheaton, Ill., assignor to Stanadyne, Inc., Windsor, Conn.

Filed May 16, 1977, Ser. No. 797,296

Int. Cl.[2] F01L *1/14, 1/16*

U.S. Cl. 123—90.51 **2 Claims**

1. An internal combustion engine tappet to be used in the as cast condition on steel camshafts and having high resistance to spalling and scuffing comprising a body having at least a wearing surface formed of chilled high strength alloy cast iron consisting essentially of the following composition:

Element	Percent by Weight
Carbon	3.10–3.60
Silicon	2.00–2.90
Manganese	0.60–0.90
Chromium	0.20–0.80
Nickel	0.30–0.60
Molybdenum	1.50–5.00
Vanadium	0.10–0.50
Iron (plus minor sulphur and phosphorus elements)	Balance

4,153,018

AIR FLOW MEASURING DEVICE FOR INTERNAL COMBUSTION ENGINES

Kei Kimata, Aichi; Tsugito Nakazeki, Iwata, and Yoshinobu Yasuda, Iwata, all of Japan, assignors to NTN Toyo Bearing Co. Ltd., Osaka, Japan

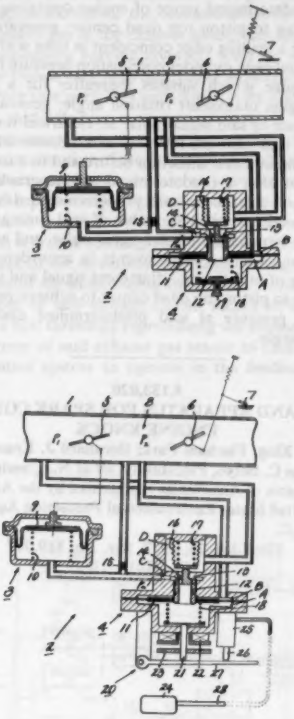
Filed Jul. 30, 1976, Ser. No. 710,126

Claims priority, application Japan, Jul. 31, 1975, 50-93972; Sep. 2, 1975, 50-106795

Int. Cl.[2] F02D *11/08;* **F16K** *31/12*

U.S. Cl. 123—103 R **3 Claims**

1. In an internal combustion engine having a fuel control unit, an air suction pipe means, and pedal accelerator means, the improvement of an air fuel ratio compensating device for improving the performance of the engine, said compensating device comprising a flow detection valve positioned upstream in the air suction pipe means and operatively associated with the fuel control unit, a flow control valve positioned downstream in the air suction pipe means and in series with said flow detection valve, said flow control valve being operatively connected to the accelerator pedal means, said flow detection valve and said flow control valve constituting an area flow meter system whereby the difference in pressure existing on opposite sides of the flow detection valve may be maintained at a predetermined value to insure that the amount of air flow is proportional to the opening area of the flow detection valve thereby permitting a determination of the amount of air flow on basis of the opening area of the flow detection valve, a feedback control mechanism for controlling said area flow meter, said control mechanism including pressure-sensitive amplifier means for detecting and amplifying the deviation of the difference in pressure and valve opening means connected to said amplifier means and operatively associated with said flow detection valve for contolling the opening and closing of said detection valve by the output from said amplifier means, and compensating means for compensating for the set value placed in the pressure-sensitive amplifier means according to



the operating conditions of the internal combustion engine, said compensating means actuatable by the temperature of the cooling water of the engine.

4,153,019

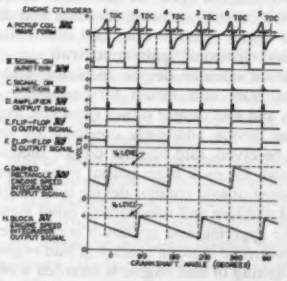
PEAK CYLINDER COMBUSTION PRESSURE IGNITION SPARK TIMING SYSTEM

Allan E. Laubenstein; Donald V. Starich, and Mitchell L. Brown, all of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 20, 1977, Ser. No. 789,239

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **10 Claims**



1. A method for timing the ignition spark events of a spark

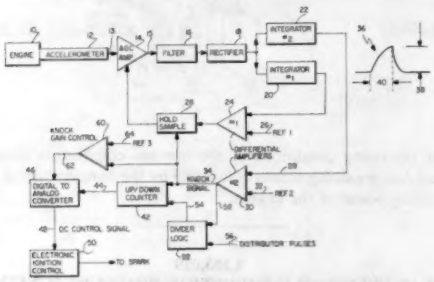
ignited internal combustion engine in a manner to achieve peak cylinder combustion pressure at a predetermined desired engine crankshaft angle relative to piston top dead center comprising the steps of: initially generating ignition spark events within a predetermined range of engine operating crankshaft angles relative to piston top dead center; generating a signal pulse having a leading edge coincident in time with the occurrence of actual peak cylinder combustion pressure in a selected engine cylinder which subsists thereafter for a preselected constant engine crankshaft rotation angle; generating during the subsistence of said signal pulse an electrical timing adjustment signal that changes in value at a substantially constant rate with time in a first direction before and in a second opposite direction after a predetermined engine crankshaft angle having a fixed relation to said predetermined desired engine crankshaft angle; sensing the value of said timing adjustment signal at the termination of said signal pulse; and adjusting the timing of said ignition spark events in accordance with the sensed value of said timing adjustment signal and in the direction relative to piston top dead center to achieve peak cylinder combustion pressure at said predetermined desired engine crankshaft angle.

4,153,020

METHOD AND APPARATUS FOR SPARK CONTROL OF ENGINE KNOCK

William H. King, Florham Park; Bernhard J. Kraus, Freehold, and Steven C. Belyo, Piscataway, all of N.J., assignors to The United States of America as represented by the Administrator of the United States Environmental Protection Agency, Washington, D.C.

Filed Jul. 26, 1977, Ser. No. 819,077
Int. Cl.[2] G01L *23/22*
U.S. Cl. 123—117 R **19 Claims**



1. An apparatus for automatic control of spark setting in order to correct for knocking in a spark-ignited internal combustion engine having an electronic ignition control comprising:

means for producing pulsed knock signals when said knocking occurs, each said knock pulse signal being representative of one said engine knock;

logic means for outputting logic pulses in response to input pulses dependent upon the distributor controlled ignition rates, the output rate being less than said distributor-controlled engine ignition rate, said distributor cooperating with said electronic ignition control;

an up/down counter device receiving said knock signal outputs from said means for producing pulsed knock signals and said output pulses from said logic means, said counter device additively counting up for each knock signal received, said counter device subtractively counting down for each logic output pulse received, whereby the output of said counter device is the instantaneous sum of said additive and substractive input signals and pulses;

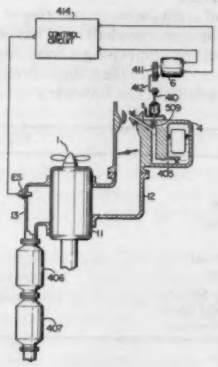
means for applying said up/down counter device output to said electronic ignition control of said engine whereby the spark setting of said engine is retarded when said counter device outputs a finite signal, and said spark setting is not retarded when said counter device output is zero, and the degree of said spark retardation is proportioned to the magnitude of said instantaneous counter device output, whereby the spark setting is responsive to the rate of knock occurrence.

4,153,021

AIR-FUEL MIXTURE RATIO CORRECTING SYSTEM FOR CARBURETOR

Tadashi Hattori, Nishio; Shigetaka Takada, Oobu; Kenji Hayashi, Aichi, and Toshiharu Iwata, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 475,917, Jun. 3, 1974, Pat. No. 4,036,186.
This application Jan. 10, 1977, Ser. No. 758,338
Claims priority, application Japan, Jun. 4, 1973, 48-63243; Jun. 4, 1973, 48-63244; Jun. 4, 1973, 48-63245; Jul. 26, 1973, 48-84346; Sep. 27, 1973, 48-109060
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—119 EC **9 Claims**



1. An air-to-fuel ratio controlling system for an internal combustion engine comprising:

a carburetor connected to an intake manifold of an internal combustion engine and including an intake passage, a fuel supply means for supplying fuel through a fuel passage into said intake passage to form, in said intake passage, an air-fuel mixture to be supplied to said engine, and a main valve positioned in said intake passage for controlling the amount of the air-fuel mixture;

means connected with said fuel supply means for controlling the amount of the fuel to be supplied into said intake passage to compensate the air-to-fuel ratio of said air-fuel mixture;

a pulse motor coupled to said fuel control means for driving the same in order to control the degree of the fuel supply;

a pulse generator for generating a train of pulses having a frequency which varies in proportion to the rotational speed of said engine;

a frequency divider connected to said pulse generator for converting the train of pulses from said pulse generator into plural trains of pulses having different and lower frequencies;

detecting means for detecting a rapid change of the operational speed of said internal combustion engine;

selecting means connected to said detecting means for selecting one of said plural trains of pulses from said frequency divider in accordance with the detected change in the operational speed of said engine;

air-to-fuel ratio sensing means disposed in an exhaust manifold of said internal combustion engine for detecting the air-to-fuel ratio of the air-fuel mixture supplied to said engine; and

a control circuit connected to said selecting means, said air-to-fuel ratio sensing means and said pulse motor for

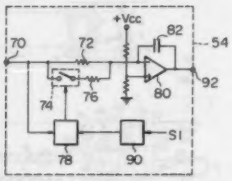
driving said pulse motor at a speed determined by the selected train of pulses from said selecting means, the rotational direction of said pulse motor depending on the output from said air-to-fuel ratio sensing means.

4,153,022

ELECTRONIC CLOSED LOOP AIR-FUEL RATIO CONTROL SYSTEM

Masaharu Asano, and Mitsuhiko Ezoe, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 5, 1977, Ser. No. 794,138
Claims priority, application Japan, May 8, 1976, 51-51695
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—119 EC **10 Claims**



1. An electronic closed loop air-fuel ratio control system for supplying an optimum air-fuel mixture to an internal combustion engine, which system comprises in combination:

an air-fuel mixture supply assembly connected to the engine;

an exhaust gas pipe connected to the engine;

an exhaust gas sensor provided in the exhaust pipe for sensing the concentration of an exhaust component in the exhaust gases for generating a concentration representative signal;

a comparator responsive to said concentration representative signal for generating a comparator signal at one of high and low values depending upon whether said concentration representative signal is above or below a reference value;

an integral controller connected to the comparator including a first resistor and a capacitor connected in series thereto, a second resistor and switching means which, when energized, connects said first and second resistors in parallel circuit relation;

a monostable multivibrator responsive to said comparator signal to generate an electrical pulse for energizing said switching means;

means for generating a signal of which the magnitude is an inverse function of the speed of said engine, said signal being applied to said monostable multivibrator for the varying duration of said electrical pulse; and

an actuator provided in the air-fuel mixture supply assembly responsive to the output of said integral controller to control the air-fuel ratio of the mixture fed to the engine.

4,153,023

EXHAUST GAS SENSOR TEMPERATURE DETECTION SYSTEM

Masaharu Asano, Yokosuka, and Akio Hosaka, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

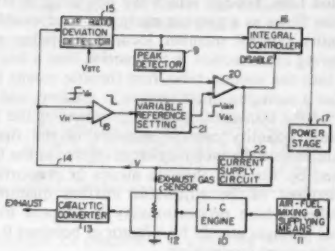
Filed Dec. 23, 1977, Ser. No. 863,604
Claims priority, application Japan, Dec. 28, 1976, 51-157568
Int. Cl.[2] F02B *75/10*
U.S. Cl. 123—119 EC **10 Claims**

1. In a mixture control system for an internal combustion engine having an exhaust gas sensor for supplying a control signal to the mixture control system, a detection system for detecting when the temperature of the gas sensor is at or above its operating temperature to allow said mixture control system to operate said engine in a closed-loop control mode and detecting when the temperature of the gas sensor is below its operating temperature to allow said mixture control system to operate the engine in an open-loop control mode, wherein said sensor is operable at a high temperature for generating a voltage signal representative of the concentration of a predetermined constituent gas in the exhaust gases, said sensor having an internal impedance varying inversely with the temperature of said sensor from a very high impedance at its low, nonoperable temperature to a very low impedance at its high operating temperature, said detection system comprises:

exhaust gas sensor output circuit means for generating a signal representative of the deviation of said concentration representative voltage signal from a predetermined voltage level representing a desired air-fuel ratio;

storage circuit means for detecting the peak value of said deviation representative signal and storing the most recent peak value of the deviation representative signal;

a first detector for determining the relative voltage level of the output of said storage circuit means to the voltage level of a first threshold representing the normal operating temperature of said exhaust gas sensor to cause said mixture control system to operate in the feedback control



mode when the output of said storage circuit means is greater than said threshold level or cause said mixture control system to operate in the open control mode when the output of said storage circuit means is smaller than said threshold level;

means for supplying a current flow to said exhaust gas sensor in response to the presence of said disabling signal to thereby increase the voltage across its internal impedance; and

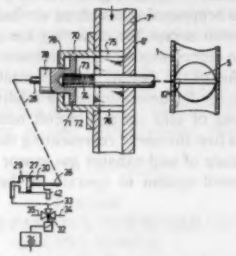
a second detector for determining the relative voltage level of the output of said exhaust gas sensor to the voltage level of a second threshold higher than the maximum output level of the exhaust gas sensor when operating at or above the normal operating temperature, and lower than the minimum output level of the exhaust gas sensor when operating below its normal operating temperature in the presence of said current flow, for switching the control modes of said mixture control system from the open to closed modes when the increased voltage output of said exhaust gas sensor falls below said second threshold as the output of said gas sensor decreases inversely with the temperature of the gas sensor.

4,153,024

DEVICE FOR INFLUENCING THE COMPOSITION OF THE OPERATING MIXTURE SUPPLIED TO AN INTERNAL COMBUSTION ENGINE

Johannes-Gerhard Bertling, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 3, 1977, Ser. No. 765,137
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604853
Int. Cl.[2] F02M *23/04*
U.S. Cl. 123—124 R 21 Claims



1. In a device for influencing the composition of the operating mixture supplied to an internal combustion engine, comprising:

a suction tube through which the operating mixture of the engine flows as a gaseous medium; an adjustable mixture quantity control member located to define a variable metering cross section in the suction line; a line discharging into the suction tube; first throttle means located to define a metering cross section in the line; and a sensing device for transmitting the adjustment of the adjustable mixture quantity control member to the first throttle means so that the metering cross section in the line can be varied by the first throttle means in proportion to the adjustment of the adjustable mixture quantity control member, which proportionality is adapted to be influenced multiplicatively by a factor of between 0 and 1, the improvement comprising:

second throttle means located for further defining the metering cross section in the line; and control means connected to the second throttle means and to the engine to determine the operating state of the engine, the second throttle means being adjusted by the control means so that the metering cross section in the line can be further varied by a factor of between 0 and 1, and whereby the first throttle means can hold the metering cross section in the line closed independently of the position of the second throttle means.

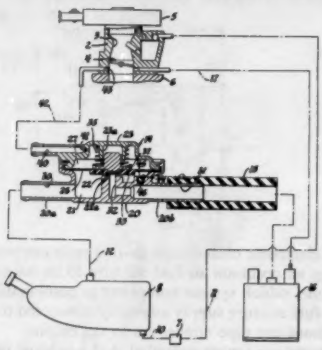
4,153,025

FUEL TANK VAPOR FLOW CONTROL VALVE

William F. Thornburgh, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1977, Ser. No. 856,654
Int. Cl.[2] F02M *59/00*
U.S. Cl. 123—136 4 Claims

1. In an evaporative emission control system for an internal combustion engine having a fuel tank for supplying fuel to the throttle valve controlled induction passage of the engine, a vapor storage canister used to store fuel vapor for delivery to the induction passage of the engine during engine operation, and a vent conduit means with a vapor flow control valve therein connecting a fuel vapor passage of the fuel tank to the inlet of the vapor storage canister, the improvement wherein said vapor flow control valve, for controlling flow of fuel vapor from the fuel tank to the vapor storage canister, includes a housing providing an internal cavity with an upstanding boss having a valve seat at one end and having a passage therein extending through said valve seat to be in communication with said cavity, valve means including a diaphragm positioned in said housing to divide said cavity into a vapor chamber on the one side thereof adjacent said valve seat and a vacuum chamber on the other side thereof, said housing having a vapor inlet to said vapor chamber connected to the fuel vapor passage of the fuel tank, an outlet connected at one end to said passage and its other end in communication with the inlet of the vapor storage canister, said valve means being movable in said housing relative to said valve seat between a first position blocking flow from said vapor chamber to said passage and a second position permitting vapor flow from said vapor chamber into said passage to said outlet, said valve means including spring means of a first predetermined force operatively positioned



whereby said valve means is normally biased to said first position, a vacuum port in said housing opening at one end into said vacuum chamber and operatively connected at its other end to the induction passage downstream of the throttle valve whereby during engine operation manifold vacuum is applied to one side of said diaphragm to effect movement of said valve means to said second position when manifold vacuum is above a predetermined value, said valve means also being movable to said second position by fuel vapor pressure above a predetermined pressure acting on the side of the diaphragm exposed to the vapor chamber and, controlled flow passage means including a sized orifice passage in said housing providing a secondary vapor flow connection between said vapor chamber and said outlet.

4,153,026

CARBURETOR FOR STRATIFIED CHARGE COMBUSTION ENGINE

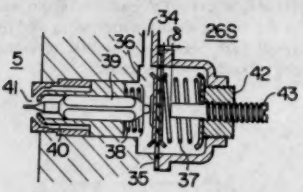
Masami Nagano, and Satosi Suzuki, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

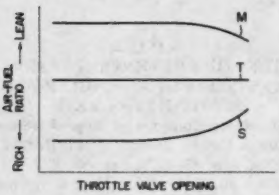
Filed Nov. 23, 1976, Ser. No. 744,398
Claims priority, application Japan, Nov. 25, 1975, 50-140152
Int. Cl.[2] F02M *59/00*
U.S. Cl. 123—139 AW 4 Claims

1. A carburetor for a stratified charge combustion engine of the type wherein a fuel pressure control valve is provided which is adapted to change a pressure difference between the portions upstream and downstream of a metering jet in proportion to the variations of negative pressure produced at a venturi portion provided in a passage for feeding air to an associated engine and a supply of fuel passing through the metering jet is divided and respectively supplied to a diaphragm type main discharge valve and a diaphragm type auxiliary discharge valve respectively provided in a main air intake passage and an auxiliary air intake passage both of which are provided downstream of said venturi portion, the improvement comprising:

valve adjustment means for causing air-fuel ratios of mixtures produced in the main air intake passage and the auxiliary air intake passage by said main and auxiliary

discharge valves, respectively, to be changed in different manners by said fuel pressure control valve in response to the change of fuel pressure supplied to said main and auxiliary discharge valves, respectively, by changing the





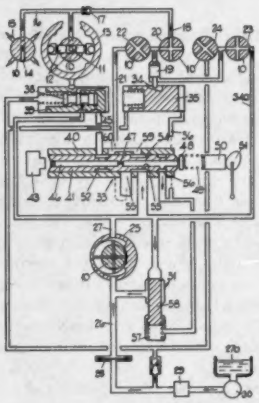
respective flow rates of fuel supplied by the main and auxiliary discharge valves in different manners while maintaining the resultant combined air-fuel ratio supplied to said engine substantially constant, thereby eliminating the need for any other fuel flow division control means.

4,153,027

FUEL INJECTION PUMPING APPARATUS

Moshe Drori, East Twickenham, England, assignor to C.A.V. Limited, Birmingham, England

Filed Sep. 1, 1977, Ser. No. 829,875
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AQ **11 Claims**



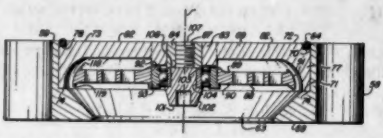
1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising an injection pump, a feed pump for supplying fuel under pressure to the injection pump, an axially movable member disposed in a surrounding body, an adjustable orifice defined by the member and body the size of said orifice determining the amount of fuel supplied to the engine at each injection stroke by the injection pump, a pivotal centrifugal weight acting on one end of the member and urging the member in an axial direction to reduce the size of said orifice, a governor spring acting to urge the member against the action of said weight, operator adjustable means for varying the force exerted by said spring whereby the weight, spring and orifice together constitute a governor to control the speed of the associated engine in accordance with the setting of the operator adjustable means, a reaction member for the pivot of said weight, resilient means, said resilient means acting to urge the reaction member and pivot in opposition to said governor spring, and a dash-pot acting to limit the rate of movement of the reaction member against the action of said resilient means when the force exerted by the governor spring is increased, a valve controlled passage in communication with the chamber of the dash-pot through which liquid can enter the dash-pot chamber at a substantially unrestricted rate.

4,153,028

ATOMIZER

Emerson L. Kumm, 1035 E. Laguna Dr., Tempe, Ariz. 85282, and Maurice J. Moriarty, 3225 W. Sahuaro Dr., Phoenix, Ariz. 85029

Filed Sep. 6, 1977, Ser. No. 831,076
Int. Cl.[2] F02M *29/02*
U.S. Cl. 123—141 **12 Claims**



1. An atomizer for placement in a moving stream of gaseous fluid having liquid particles entrained therein and for atomizing said particles to produce a substantially homogeneous gaseous-liquid fog, said atomizer comprising:

(a) a plastic housing having first and second spaced surfaces and having a generally cylindrical bore extending between said surfaces,
said bore having an inlet at said first surface and having an outlet at said second surface and receiving said stream therethrough in a direction from said first surface;

(b) a support member carried by said housing and extending transversely across said cylindrical bore;

(c) a generally cylindrical rotor having an upstream side and a downstream side and carried by said support member within said cylindrical bore and rotatable about an axis generally parallel with the movement of said stream; and

(d) a plurality of passages extending through said rotor, each said passage including an inlet on the upstream side of said rotor and an outlet on the downstream side of said rotor, and each said passage being inclined with respect to a plane radial to the axis of said rotor to urge rotation of said rotor in response to movement of said stream through said passages, each said passage including:

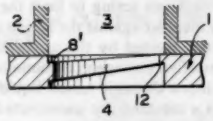
(i) a first pair of opposed walls, including an inner wall and an outer wall spaced radially from the axis of said rotor, and

(ii) a second pair of opposed walls, including a leading wall and a trailing wall spaced annularly with respect to the axis of said rotor and extending between said first walls.

4,153,029
HEAT INSULATOR FOR A CARBURETOR

Seiji Ikegaya, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 10, 1977, Ser. No. 850,617
Claims priority, application Japan, Aug. 2, 1977, 52-93090
Int. Cl.[2] F02M *29/14*
U.S. Cl. 123—141 12 Claims

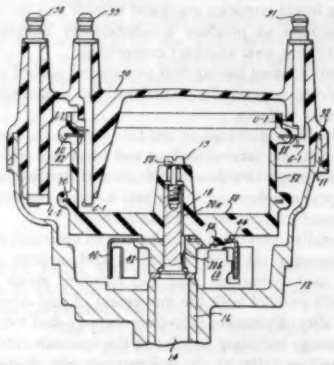


1. In an internal combustion engine having an inlet manifold and a downdraft-type carburetor having a circular bore, a heat insulator, constructed of a material having a low heat conductivity, interposed and clamped between the carburetor and the inlet manifold, said heat insulator comprising a flat elongated body defining a circular intake opening of a diameter smaller than that of said carburetor bore so that an upper annular shoulder portion is provided at the joining boundary of said carburetor bore and said intake opening, said intake opening further including an inversely arranged annular shoulder portion located downstream of said upper annular shoulder portion and formed in the wall of said intake opening and having a downwardly facing annular land face which is inclined with respect to a plane perpendicular to the central axis of said intake opening.

4,153,030
IGNITION DISTRIBUTOR WITH WIDE ROTOR REGISTRATION ANGLE

James H. Power, Ypsilanti, and Ahmet R. Akman, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 3, 1977, Ser. No. 803,197
Int. Cl.[2] F02P *7/02*
U.S. Cl. 123—146.5 A 8 Claims



1. A distributor for providing sequential electrical conducting paths between a first terminal and individual ones of a plurality of second terminals and between said first terminal and individual ones of a plurality of third terminals, comprising:

a housing;

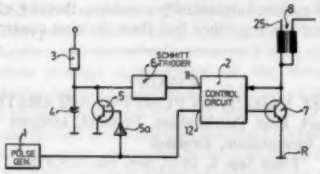
said first terminal, said second terminals and said third terminals mounted on said housing;

rotor means mounted in said housing for rotation about an axis, said rotor means including a first circularly planar electrically conductive element having a plurality of inwardly extending arcuate blades and a single outwardly extending arcuate blade for providing an electrical path between said first terminal and a selected one of said second terminals, and a second circularly planar electrically conductive element having a plurality of inwardly extending arcuate blades and a single outwardly extending arcuate blade, electrically insulated from said first element, for providing, in alternation with said first element, an electrical path between said first terminal and a selected one of said third terminals.

4,153,031
APPARATUS FOR PREVENTING SPARKS IN THE IGNITION SYSTEM OF AN ENGINE WHILE THE ENGINE IS AT REST

Bernd W. Kalkhof, Reutlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 872,880
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705715
Int. Cl.[2] F02P *9/00;* H05B *41/14*
U.S. Cl. 123—146.5 D 5 Claims



1. In an ignition system for internal combustion engine having

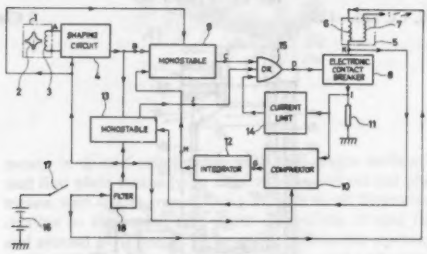
a source of DC voltage an ignition coil (8) connected to said source of DC voltage, said ignition coil having a primary winding and a secondary winding, spark producing means connected to said secondary winding, output switch means (7) connected in series with said primary winding and having a conductive and a nonconductive state respectively permitting and blocking current flow through said primary winding, whereby switching said output switch means from said conductive to said nonconductive state induces a secondary voltage across said secondary winding and a spark in said spark producing means if said secondary voltage exceeds a predetermined secondary voltage, said ignition system further having first control means (3–6, 13) for switching said output switch means from said conductive to said nonconductive state if said output switch means is in said conductive state when said engine is at rest:

apparatus for preventing the furnishing of a spark while the engine is at rest, comprising, in accordance with the invention, second control means (22, 16) connected to said output switch means and responsive to said secondary voltage, for switching said output switch means briefly back to said conductive state when said secondary voltage reaches a limiting secondary voltage less than said predetermined secondary voltage, whereby current flow through said primary winding limits the voltage build-up in said secondary winding.

4,153,032
IGNITION CONTROL DEVICE WITH MONOSTABLE ELEMENTS FOR PROVIDING A CONSTANT ENERGY SPARK

Louis J. Châteu, Rosny, France, assignor to Ducellier & Cie, Creteil, France

Filed Jul. 21, 1977, Ser. No. 817,590
Claims priority, application France, Jul. 28, 1976, 76 22927
Int. Cl.[2] F02P *1/08*; H05B *41/14*
U.S. Cl. 123—148 E 1 Claim



1. An electronic ignition control for an internal combustion engine comprising the combination of

(a) an ignition triggering signal generator adapted to be drivingly connected to an engine, the ignition of which is to be controlled;

(b) a pulse shaping circuit connected to the generator;

(c) a controlled monostable circuit connected to said shaping circuit so as thereby to be triggered into producing an output and having a control terminal the voltage signal at which determines the duration of the output;

(d) an OR gate having one input terminal connected to the output of the controlled monostable circuit;

(e) an electronic circuit breaker element controlled by said OR gate;

(f) a voltage step-up coil having a primary winding in series with said circuit breaker element and a secondary winding for connection in a circuit with a distributor and spark plugs;

(g) current sensitive means sensitive to the current flowing in said primary winding and producing a voltage signal proportional thereto;

(h) current limiting means connected to said current sensing means and to said OR gate so as to limit the primary current to a predetermined level;

(i) current comparator means connected to said current sensitive means and producing a pulse output of duration determined by the length of time for which the current sensing means output is greater than a set level corresponding to a primary current less than said predetermined level;

(j) an integrator circuit connecting to said current comparator means to said control terminal of the controlled monostable circuit so as to control the output duration of the controlled monostable circuit in accordance with the average duration of the output pulses of the comparator means; and

(k) a second monostable circuit having a fixed duration output connected to be triggered by the pulse shaping circuit and connected to the OR gate;

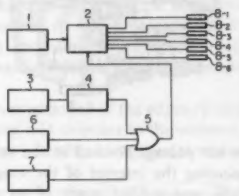
(l) the electronic circuit breaker element being switched off by the controlled monostable circuit each time a triggering signal is produced by the triggering signal generator so as to interrupt the primary current and produce a spark and being switched on again when both the controlled monostable circuit output duration and the second monostable circuit output duration have expired; and

(m) the current flowing in the primary being limited by said current limiting circuit whilst the contact breaker element is in its switched on state.

4,153,033
SYSTEM FOR DISABLING SOME CYLINDERS OF INTERNAL COMBUSTION ENGINE

Haruhiko Iizuka, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 28, 1977, Ser. No. 810,906
Claims priority, application Japan, Jul. 30, 1976, 51/90235
Int. Cl.[2] F02B *3/10*
U.S. Cl. 123—198 F 3 Claims



1. In an automotive vehicle, which includes a multi-cylinder internal combustion engine having a plurality of cylinders and associated therewith a plurality of fuel injectors to independently and respectively discharge fuel to said plurality of cylinders; a gear transmission; a clutch operatively interconnecting the engine and the gear transmission; a clutch pedal operatively connected to said clutch, said clutch normally connecting the engine with the gear transmission and being arranged to disengage the engine and the gear transmission upon depression of the clutch pedal; a fuel injection control unit operatively connected to the plurality of fuel injectors to supply fuel injection pulses thereto; and means for preventing the application of the fuel injection pulses to at least one of the plurality of fuel injectors, wherein said preventing means comprises:

a module means for producing a first logic signal upon depression of said clutch pedal beyond a predetermined point and for producing a second logic signal when said clutch pedal is between the totally undepressed position and said predetermined point of depression thereof;

a one shot multivibrator connected at the input thereof to the output of said module means, said multivibrator being so constructed and arranged as to enter a quasi-stable upon a change of the output from said module means from said first logic signal to said second logic signal; and

an OR gate connected at one of the inputs thereof to the output of said multivibrator, wherein said preventing means is responsive to the output from said OR gate and is disabled for a period of time when said one shot multivibrator is in said quasi-stable state, whereby the application of the fuel injection pulses to said at least one of said plurality of fuel injectors is permitted for said predetermined time, and wherein said predetermined period of time is long enough to cover the period of time in which said clutch pedal returns from said predetermined point to the totally undepressed position upon release of said clutch pedal.

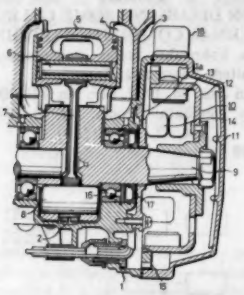
4,153,034
MAGNETO CASING

Masato Sato, Akashi, and Keiichi Nakamizo, Hyogo, both of Japan, assignors to Kawasaki Jukogyo Kabushiki, Hyogo, Japan

Filed Aug. 15, 1977, Ser. No. 824,654
Claims priority, application Japan, Aug. 19, 1976, 51-111514
Int. Cl.[2] F02B *77/00*
U.S. Cl. 123—198 E 7 Claims

1. A magneto casing of a sealed construction for an engine in

which internal pressure undergoes changes as if the magneto casing breathed as the engine operates, wherein the improvement comprises:



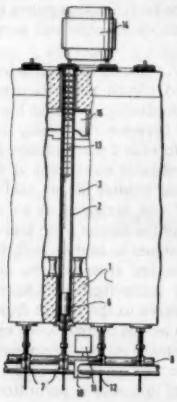
at least one air passage formed in the magneto casing for communicating the interior of the magneto casing with atmosphere; and a filter made of an air-permeable but water-repellent material mounted in said air passage.

4,153,035

FLAME BREAKER FOR INDUSTRIAL FURNACE HEATING ELEMENT

Carl-Heinz Stiasny, Bruneck, Italy, assignor to Birfield Trasmissioni S.p.A., Bruneck, Italy

Filed Aug. 19, 1977, Ser. No. 826,232
Claims priority, application Italy, Aug. 24, 1976, 26469 A/76
Int. Cl.[2] F27B *5/14*
U.S. Cl. 126—91 A **28 Claims**



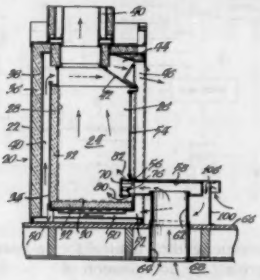
1. In a heating device for the furnace chamber of an industrial furnace having at least one burner heating element arranged in heat transfer relationship with said furnace chamber to provide heat therefor, said element having a generally elongated tubular configuration and including fuel burner means at one end thereof, the improvement comprising flame breaker means arranged to extend along portions of the length of said burner heating element between said fuel burner means and the opposite end of said element, said flame breaker means consisting essentially of a plurality of individual baffle plates mounted within and spaced from said tubular configuration of said heating element and spaced axially along the length thereof, with baffle plates located closer to said fuel burner means being formed to extend transversely across the longitudinal direction of said heating element with smaller diametral dimension to provide greater spacing from the tubular heating element than baffle plates farther from said fuel burner means.

4,153,036

FIREPLACE CONSTRUCTION

Thomas F. Billmeyer, and Francis L. Faehling, both of Wisconsin Rapids, Wis., assignors to Preway Inc., Wisconsin Rapids, Wis.

Continuation of Ser. No. 703,684, Jul. 8, 1976, abandoned, which is a division of Ser. No. 604,613, Aug. 14, 1975, Pat. No. 4,095,581. This application Nov. 21, 1977, Ser. No. 853,561
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **2 Claims**



1. In a fireplace construction, the combination of:
a firebox having an open side and a combustion gas outlet adapted to be in fluid communication with a flue;
a transparent door for substantially sealing said open side;
a housing at least partially surrounding said firebox in close proximity thereto;
a circulating air inlet in said housing below said open side through which air in a structure housing the fireplace may enter said housing;
a circulating air outlet in said housing above said open side through which air in said housing may exit the housing to re-enter the structure housing the fireplace,
said housing, said circulating air inlet and outlet defining a circulating air flow path about said firebox;
means forming a combustion air inlet in said firebox below said door through which combustion air may enter said firebox;
a hearth structure positioned forwardly of the housing below said door overlying said circulating air inlet and said combustion air inlet,
said hearth including a three-walled vertical support adapted to be disposed on the floor of the structure housing the fireplace having an open side abutting the fireplace and a horizontal member seated on the upper end of said support having downturned sides spaced outwardly from said support, said support having cutouts at the upper end thereof masked by said downturned sides to permit air within the structure housing the fireplace to enter said hearth and have free access to said circulating air inlet; and
an inlet conduit for combustion air having one conduit section connected to said combustion air inlet and an entry section extending downwardly through said hearth structure with its outer end positioned exteriorly of the structure housing the fireplace.

4,153,037

SOLAR COLLECTOR MODULE AND SOLAR COLLECTOR SYSTEM

Boris Isaacson, 14532 Vanowen St., Van Nuys, Calif. 91405

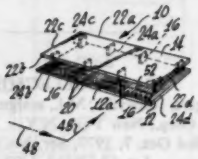
Filed Jul. 21, 1977, Ser. No. 817,559
Int. Cl.[2] F24J *3/02*; F28F *3/14*
U.S. Cl. 126—270 **21 Claims**

1. A solar collector module which comprises:
a first plate means, of predetermined width and length

dimensions, having a plurality of fluid flow paths formed in a major surface thereof;

a second plate means having substantially the same width and length dimensions as said first plate and being spaced from, and overlying said first plate means; and

spacer means affixed to and between said first and second plate means for maintaining said first and second plate



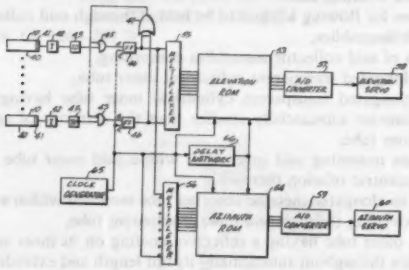
means in spaced relationship with said major surface of said first plate means lying adjacent the said second plate means, said spacer means being of such small dimensions relative to the length and width dimensions of said first and second plate means as to define substantial openings in all sides between said first plate means and said second plate means.

4,153,038

SOLAR ENERGY COLLECTING SYSTEM

Bernard McDonald, 7700 Seville Ave., Huntington Park, Calif. 90255

Filed Aug. 15, 1977, Ser. No. 824,495
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **8 Claims**



1. A solar energy collecting system comprising:

a plurality of stationary directional solar energy sensors each positioned skyward at a different orientation defined by a unique combination of elevation and azimuth so only one sensor at a time receives appreciable solar energy;

a solar energy collector;

means for supporting the collector so it is movable in elevation and azimuth; and

means responsive to the sensors for moving the collector to the unique combination of elevation and azimuth of the sensor receiving solar energy.

4,153,039

FOCUSING SOLAR ENERGY APPARATUS

John H. Carroll, 3021 Grand Ave., Fillmore, Calif. 93014

Filed Jan. 7, 1977, Ser. No. 757,618
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **10 Claims**

1. A solar energy producing apparatus comprising:

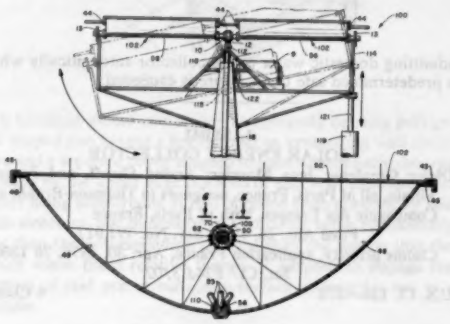
a fixed support;

a mounting assembly connected to said fixed support, said mounting assembly being pivotly mounted about a first picot axis;

at least one in number solar energy collecting unit collected to said assembly, said collecting unit being pivotly mounted about a second pivot axis upon said mounting assemby, said first pivot axis being substantially perpendicular to said second pivot axis, said collecting unit being in the shape of an elongated trough defining an enclosed longitudinal smooth walled chamber having a longitudinal center axis, said smooth walled chamber being parabolic in transverse cross-section, the interior surface of said chamber being light reflective;

a heat pipe assembly located within said enclosed chamber and positioned parallel to the longitudinal axis of said trough, said heat pipe assembly being spaced from said wall of said chamber and located at the approximate middle in cross-section of said enclosed chamber, said heat pipe assembly including an elongated metallic tubular body which has an interior closed fluid conducting conduit therein;

a transparent cover attached to the edges of said wall of said chamber closing said chamber to the ambient, the position of said heat pipe assembly being predetermined in view of



the selected parabolic curve of said chamber wall so that light rays passing substantially perpendicular through said transparent cover are reflected from said wall of said interior chamber toward said heat pipe assembly; and

the exterior surface of said tubular body including a plurality of spaced-apart, sharp-walled grooves thereby forming a plurality of spaced-apart pointed fins extending radially from said longitudinal center axis of said tubular body, said grooves being constructed to reflect substantially all contacting light rays back and forth between adjacent pairs of said fins with each reflection moving nearer said longitudinal center axis of said tubular body, a transparent envelope evenly spaced from and totally enclosing said tubular body, said outermost end of said sharp pointed fins being significantly spaced from the inner wall of said transparent envelope to achieve an air space therebetween thereby minimizing heat losses due to convection and conduction.

4,153,040

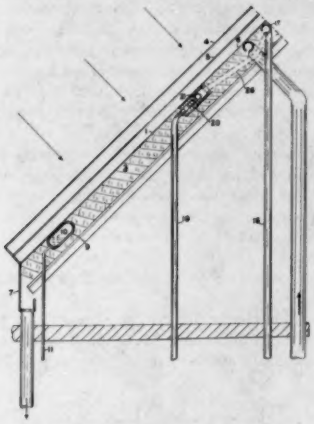
PROTECTIVE COOLING SYSTEM FOR SOLAR HEAT COLLECTOR

Henry Harrison, and Henry C. Harrison, both of Locust Valley, N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Sep. 20, 1976, Ser. No. 725,032
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **7 Claims**

1. An auxiliary system for cooling a solar collector of the type having circulating fluid and mounted in a structure having a domestic water supply, when normal circulation fails,

comprising direct mechanical temperature responsive means and means responsive to the temperature responsive means for



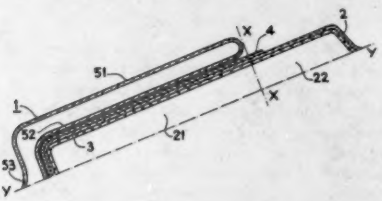
admitting domestic water to the collector automatically when a predetermined safe temperature is exceeded.

4,153,041

SOLAR ENERGY COLLECTOR

Didier Grauleau; Jean Mourier; Arvind Shroff, and Jacques Villain, all of Paris, France, assignors to Thomson-Brandt and Compagnie des Lampes, both of Paris, France

Filed Apr. 26, 1977, Ser. No. 791,017
Claims priority, application France, Apr. 30, 1976, 76 13002
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **4 Claims**



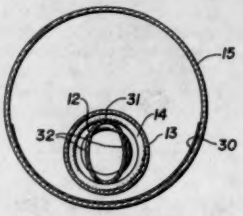
1. A device for collecting solar energy comprising: a closed first envelope filled with a fluid at saturating vapour pressure, comprising at least an evaporator and a condenser, said evaporator being exposed to the incident solar radiation, said fluid therein passing to the vapour state, said vapour condensing in said condenser which is placed outside said incident radiation for giving up the heat to the surrounding medium; means for returning the fluid in a liquid phase to the evaporator, said means being placed inside said first envelope; a closed second envelope located around said first envelope at least in the evaporator part therof; thermal insulation means between said evaporator and an outer surface of said second envelope; and wherein at least the evaporator of said first envelope is covered with a material which absorbs said incident radiation; said absorbent material consists of one material selected from the group constituted by zinc, molybdenum and tungsten; said thermal insulating means comprises a gaseous medium between the evaporator and an outer wall of said second envelope at a pressure lower than atmospheric pressure; said pressure of said gaseous medium being lower than 1.3 10^{-2} Pascal; said thermal insulating means comprises, at least on the part exposed to the incident radiation of the inner surface of the second envelope, a filtering layer which transmits said incident radiation and reflects the infrared radiation coming from said evaporator; said filtering layer is constituted by indium oxide In_2O_3; said thermal insulating means comprises, in a part of the inner surface of the second envelope which is opposed to that exposed to the incident radiation, a layer reflecting said incident radiation; said fluid consists of one fluid selected from a group constituted by water, glycol, alcohol, ammonia and a mixture of said fluids; said means for returning the fluid comprises a capillary system disposed along the inner wall of said first envelope, and said capillary system is constituted by sintered material.

4,153,042

SOLAR COLLECTOR

William E. Tragert, Rockville, Md., assignor to National Patent Development Corp., New York, N.Y.

Filed Oct. 7, 1977, Ser. No. 840,411
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **8 Claims**



1. A solar collector including
a housing,
a plurality of tubular collector assemblies mounted within said housing, and
means for flowing a liquid to be heated through said collector assemblies,
each of said collector assemblies comprising,
an elongated transparent cylindrical outer tube,
an elongated transparent cylindrical inner tube having a diameter substantially smaller than the diameter of said outer tube,
means mounting said inner tube within said outer tube in eccentric relation therewith,
and an elongated metallic absorber tube mounted within and extending through said inner transparent tube,
said outer tube having a reflective coating on its inner surface throughout substantially its full length and extending no more than about halfway therearound, the ratio of the diameter of the inner transparent tube to that of the absorber tube being much smaller than the ratio of the diameter of the outer transparent tube to the diameter of the inner transparent tube.

4,153,043

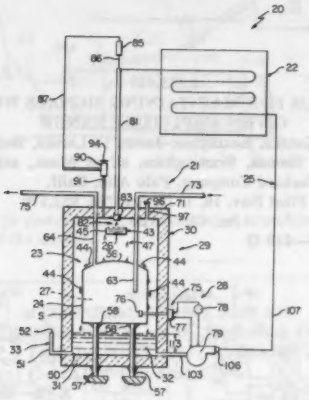
APPARATUS FOR SOLAR HOT WATER SYSTEM AND METHOD OF MAKING SAME

Patrick F. Goolsby, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Oct. 31, 1977, Ser. No. 846,777
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **21 Claims**

1. In a solar hot water system having a collector subsystem; a hot water storage subsystem having a hot water tank; an energy transport subsystem operatively connected between said collector and hot water storage subsystem and including a heat transfer liquid; apparatus for heating and maintaining the temperature of water in said tank; and a control subsystem for said subsystems and apparatus; the improvement wherein said apparatus for heating and maintaining the temperature of water in said tank comprises, a thermally insulating container disposed around and in spaced relation from said tank, said

container having a bottom portion defining a sump within said container for said heat transfer liquid, and a device for maintaining the level of said liquid in said sump beneath said tank during normal operation to thereby assure maintenance of an



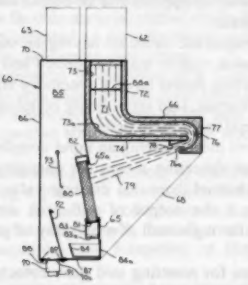
air space substantially completely around said tank, said air space cooperating with said insulating container to assure the temperature of water in said tank is maintained with minimum loss.

4,153,044

BACKSHELF VENTILATING HOOD

Louis A. Nett, P.O. Box 199N, Rte. #1, Cambridge, Wis. 53523

Filed Jan. 23, 1978, Ser. No. 871,301
Int. Cl.[2] F24C *15/20*; F23J *11/00*
U.S. Cl. 126—299 D **26 Claims**



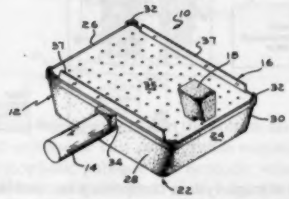
1. A ventilating hood comprising a hood enclosure having a top wall means and a partially enclosing side wall means arranged to form an enclosure having an opening in the sidewall means for access into the enclosure, an air supply channel means associated with said hood enclosure, said air supply channel means extending along the top wall means and receiving forced air and directing the air received to the front of said top wall means along a substantial portion of the length of said top wall; deflector means associated with said top wall for deflecting the air from said air supply channel at the front of said top wall means backwardly and downwardly into said enclosure toward said back wall as a thin curtain of air across the enclosure, exhaust channel means associated with said hood enclosure, said enclosing wall means has a back wall portion with a vertically extended exhaust opening therein positioned to receive the air curtain discharged from said deflector means, said exhaust channel directing air received from said exhaust opening to a discharge opening in said hood enclosure for exhaust to the atmosphere, and a fume filter interposed in said exhaust opening, said fume filter being canted backwardly at an angle from vertical with the upper end of the filter located backwardly of the lower end such that the air directed downwardly and backwardly from said deflector means strikes said filter approximately perpendicularly to the filter thereby to minimize vortexing of the supply air at the filter and provide efficient exhaust therethrough.

4,153,045

COOKING UTENSIL

Russell E. Phelon, Rio Piedras, P.R., assignor to Phelon Magnagrip Co. Inc., East Longmeadow, Mass.

Filed Dec. 7, 1977, Ser. No. 858,434
Int. Cl.[2] A47J *27/58*
U.S. Cl. 126—384 **10 Claims**



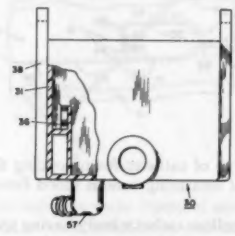
1. Cooking utensil comprising an upwardly opening polygonal shaped pan having a bottom and an upstanding wall structure and a separate cover adapted to span substantially the area defined by the upper edge portions of said wall structure, said cover being supportable at two opposed edge portions by said wall structure, one dimension of said cover being substantially less than the corresponding dimension of the pan so that the cover when tilted relative thereto is adapted to engage the bottom of said pan in surface-to-surface contact for use as a spatula.

4,153,046

PLASTIC, HEATED WATER CONTAINER FOR TAPE MACHINES

Forrest G. Hill, East St. Louis, Ill., assignor to The Marsh Stencil Machine Co., Belleville, Ill.

Filed Nov. 10, 1977, Ser. No. 850,211
Int. Cl.[2] A47J *27/00*
U.S. Cl. 126—390 **10 Claims**



1. In a tank for a tape dispensing machine or the like: the tank being adapted to hold liquid, and to engage a heating element that is external to the tank device to heat the liquid; the tank being of plastic material of relatively low heat conductivity; and a metal member of relatively high heat conductivity molded into the plastic tank, the metal member being in the lower part of the tank so as to be below the liquid level thereof, and constituting a wall portion for the tank exposed on one side to the interior of the tank and on the other side to the exterior thereof, and means including embedding of an end of the wall portion in the plastic to prevent leakage from the tank around

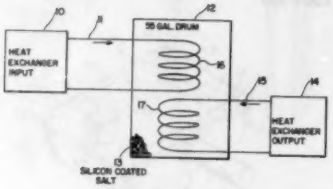
the end of the metal wall portion, the plastic extending continuously around the edge of the metal member, the plastic and the metal member having interengaging surfaces at said end affording resistance to relative movement in all directions, between the plastic and the metal, to avoid separation of the metal member and the plastic that could permit leakage.

4,153,047

HEAT STORAGE SYSTEMS

Robert F. Dumbeck, 104 Anderson Dr., Elgin, Tex. 78621

Filed Jul. 13, 1977, Ser. No. 815,550
Int. Cl.[2] F24H *7/04*
U.S. Cl. 126—400 **25 Claims**



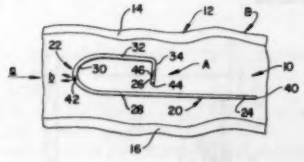
1. A heat storage system comprising in combination,
a body of granular heat storage particles in adjacent contact with each other adapted to receive and store heat,
a wetting agent covering the particles with an adhering liquid coating uniformly covering all exposed surfaces with a film that does not drain off,
and heat transfer means in thermal contact with said wetting agent thereby transferring heat from said storage particles through thermal exchange by contact through said wetting agent to substantially the entire interfacing surface areas of the particles.

4,153,048

THERMODILUTION CATHETER AND METHOD

Fabio Magrini, Milan, Italy, assignor to Cleveland Clinic Foundation, Cleveland, Ohio

Filed Sep. 14, 1977, Ser. No. 833,163
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—692 **13 Claims**



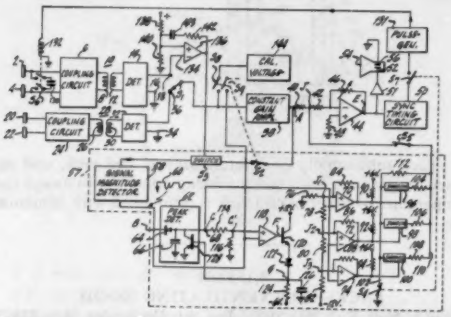
1. A pigtail type of catheter for practicing the thermodilution technique of measuring venous blood flow, said catheter comprising:
an elongated hollow catheter body having spaced apart first and distal ends, said body merging into a pigtail portion including said distal end and forming a reversing loop-like area extending back over said body toward said first end with at least said distal end extending generally back toward said body adjacent the area of merger thereof with said pigtail portion; a supply lumen at said first end for introduction of a fluid injectate into said hollow catheter body and a first aperture in said pigtail portion communicating with the hollow interior of said catheter body to allow fluid injectate flow outwardly of said catheter into said venous flow; and, temperature sensing means operably associated with said pigtail portion spaced therealong toward said distal end from said first aperture for sensing a temperature change in said venous flow after said fluid injectate has been injected thereinto through said first aperture.

4,153,049

APPARATUS FOR MAINTAINING SIGNALS WITHIN A GIVEN AMPLITUDE RANGE

Ronald D. Gatzke, Lexington; James L. Larsen, Bedford, and Elliott S. Simons, Framingham, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 16, 1977, Ser. No. 852,170
Int. Cl.[2] D61B *5/04*
U.S. Cl. 128—419 D **4 Claims**



1. Apparatus for controlling the amplitude of information signals flowing in a signal channel that may have peaks on either side of a baseline comprising,
a signal channel having an input to which the information signals may be applied and an output for passing information signals,
a signal magnitude detector having an input to which said information signals may be applied and an output,
peak detecting means having a memory and having an input and an output, said input being coupled to said output of said signal magnitude detector,
gain control means having an input coupled to the output of said peak detecting means for changing the gain of said signal channel from one discrete value to another as the voltage at the output of said peak detecting means increases through each of a plurality of predetermined levels, and
reset means for resetting said peak detector when the voltage at the output of said signal magnitude detector is less than a given fraction of the voltage at the output of said peak detector for a predetermined length of time.

4,153,050

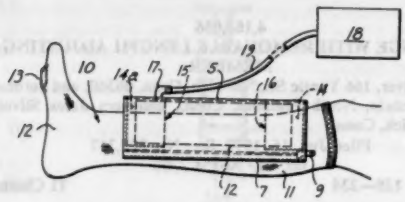
PULSATILE STOCKING AND BLADDER THEREFOR

Robert C. Bishop, Los Angeles; Pradip V. Choksi, Northridge, and Richard J. Forstrom, Granada Hills, all of Calif., assignors to Alba-Waldensian, Incorporated, Valdese, N.C.

Filed Jul. 29, 1977, Ser. No. 820,104
Int. Cl.[2] A61H *7/00*
U.S. Cl. 128—64 **21 Claims**

1. A device for use in applying pulsatile compression to a patient comprising: a porous air breathable circumferentially elastic tube; and a panel secured at circumferentially spaced locations to an exterior of the tube to provide a bladder receiv-

ing cavity between the panel and the tube, said panel being substantially less elastic than the tube in a circumferential



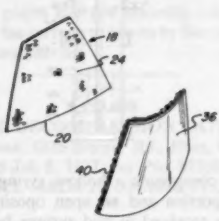
direction to restrict the circumferential stretching of only a portion of the device.

4,153,051

COMPOUND SPLINT AND KIT

Ronald D. Shippert, 6260 S. Ivy St., Englewood, Colo. 80110

Filed Jul. 8, 1977, Ser. No. 813,800
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—89 R **12 Claims**



1. A compound splint for application to a traumatized portion of a human body, including bones to be knitted together, a base layer of thin flexible material coated with adhesive on at least one side and adapted to be adhesively secured to the traumatized portion, said splint comprising:

a secondary component in the form of a layer of flexible material of less area than the base layer having a first face adapted to be adhesively secured to the base layer and a second face provided with a multiple loop, hook-receiving formation;

and a primary restraining component of malleable metallic material having a planform substantially identical to the planform of the secondary component and provided on one face with a multiple hook formation to anchoringly engage the multiple loop formation of the secondary layer;

the primary restraining component being manually formable in situ to correspond to the shape of the traumatized portion and securable in place by the hook and loop formations to prevent change in the size and shape of the traumatized portion during recovery.

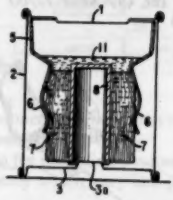
4,153,052

ORTHOPEDIC CAST PACKAGE

Andrew G. Tsuk, Plattsburgh Clinton, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 737,944, Nov. 2, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,277
Int. Cl.[2] A61F *13/04;* **B65D** *77/04, 85/676;* **A61L** *15/07*
U.S. Cl. 128—90 **14 Claims**

1. An orthopedic cast package consisting essentially of an outer container having a bottom wall, a peripheral side wall extending upwardly from said bottom wall and providing an open upper end of said container, a closure and associated means for providing a vapor-tight seal on said upper end of said outer container, a hollow-core cylindrical roll of orthopedic tape having closure means for the core at its lower end mounted within said outer container, said tape being of liquid pervious material and said tape roll being supported concentrically with respect to said peripheral side wall of the outer container, the outer diameter of said tape roll being less than the inner diameter of said peripheral side wall and the height of tape roll being less than the height of the peripheral side wall, and means for supporting said tape roll in a spaced relationship away from said bottom wall and concentrically with respect to said peripheral side wall of the outer container, said support



means permitting free drainage from the bottom surface of said tape roll, said orthopedic cast package also containing a solution of a thermoplastic polymer in a nontoxic volatile solvent having a polymer concentration of at least about 20% by weight; wherein the supporting means for said tape roll also defines a chamber having an upper section and a lower section, whereby both sections of said chamber meet where the chamber has a diameter less than the diameter of the tape roll and larger than the closed hollow core of the tape roll, said lower section comprising about 20 to about 50% of the internal volume of the outer container.

4,153,053

METHOD OF REDUCING MALAR FRACTURES USING A HAMMER DISIMPACTOR

Eleazar Figallo E., Clinica El Avila Altamira, Caracas, Venezuela

Filed Sep. 12, 1977, Ser. No. 832,624
Int. Cl.[2] A61B *17/18;* **A61F** *5/04*
U.S. Cl. 128—92 E **3 Claims**

1. A method of reducing malar fractures using an instrument comprising a rod, a hook attached to one end of said rod, a mass slidably engaging said rod, and main stopping means connected to said rod between said mass and the end of said rod opposite said hook, for stopping said mass when said mass is sliding on said rod in the direction away from said hook, said method comprising the steps of:

(a) making an incision in the skin in the vicinity of the fractured malar;

(b) inserting the point of the hook of said instrument into the incision and positioning said hook so that said hook is under the lower edge of the malar;

(c) securing said hook against the internal face of the malar;

(d) causing said mass to slide on said rod and impact said

main stopping means, whereby the force is transmitted to the bone producing a force of disimpaction thereon; and

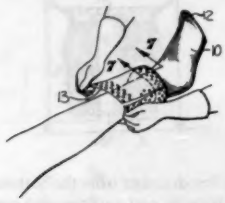
(e) unhooking the instrument from the malar and removing the instrument from the incision.

4,153,054

TUBULAR SURGICAL DRAPE

Walter S. Boone, Valdese, N.C., assignor to Alba-Waldensian, Incorporated, Valdese, N.C.

Filed Nov. 4, 1977, Ser. No. 848,399
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—132 D **8 Claims**



1. A tubular surgical drape adapted to be drawn onto and surround a patient extremity and comprising

(a) a tubular stockinette having inner and outer walls, an open end and a closed end, said tubular stockinette having the open end curled outwardly from the center thereof and rolled toward the closed end, and

(b) a pull sleeve concentrically rolled with said tubular stockinette, said pull sleeve including rupturable means extending longitudinally and substantially throughout the length thereof so that said pull sleeve will readily separate longitudinally when said pull sleeve is being drawn along the patient extremity to unroll and apply the tubular stockinette thereto.

4,153,055

PLASTIC COMPOSITION MANUFACTURE THEREOF, AND PAD FORMED THEREWITH

Donald E. Etes, Crystal Lake, Ill., assignor to Northern Illinois Research, Inc., Wonder Lake, Ill.

Continuation of Ser. No. 600,847, Jul. 31, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,797
Int. Cl.[2] F23H *9/00, 11/24;* F24B *1/08;* C08K *5/16*
U.S. Cl. 128—156 **17 Claims**

1. A process of making a plastic composition adapted for use in contact with the skin which comprises:

reacting a mixture of about one part of acrylamide-beta methacryloxyethyltrimethylammonium methyl sulfate copolymer, and up to about 10 parts of acrylamide-sodium acrylate copolymer per part of said acrylamide-beta methacryloxyethyltrimethylammonium methyl sulfate copolymer, said acrylamide-sodium acrylate copolymer containing about 1% to about 4% by weight of sodium acrylate;

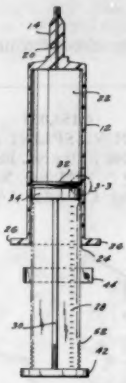
said acrylamide-beta methacryloxyethyl-trimethylammonium methyl sulfate copolymer containing about 14% to 40% by weight of said sulfate with the balance being acrylamide; and about 2 to 5 parts by weight of ethylene glycol per part of the said copolymers combined to form a gel.

4,153,056

SYRINGE WITH REMOVABLE LENGTH ADJUSTING MEMBER

Jules Silver, 166 Yantic St., Norwich, Conn. 06360, and Jerome Silverstein, North Franklin, Conn., assignors Jules Silver, Norwich, Conn.

Filed Jun. 16, 1977, Ser. No. 807,317
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—234 **11 Claims**



1. A syringe comprising a hollow syringe body having a discharge end portion and an open oposite end portion, a plunger slidably received in said syringe body through said open end portions thereof, said plunger having a first end portion located within said syringe body including a seal formed thereon forming a seal between the plunger and the interior of the syringe body; and a removable length adjusting member engaged with said plunger outside of the syringe body to variably limit operating travel of the plunger in the syringe body thereby to control the amount of material in the syringe body expelled therefrom upon depression of the plunger into the syringe body; said removable length adjusting member comprising an internally threaded nut including at least two adjacent separable edge portions and means for selectively securing said edge portions together.

4,153,057

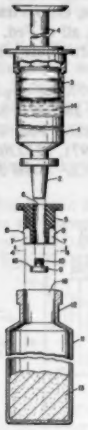
STOPPER FOR TWO-CHAMBER MIXING SYRINGE

Erich Kobel, Darmstadt, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 704,631, Jul. 12, 1976, Pat. No. 4,048,999. This application Jul. 5, 1977, Ser. No. 813,012
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533036; Oct. 17, 1975, 2546495; Jun. 6, 1977, 2725476
Int. Cl.[2] A61J *1/00*
U.S. Cl. 128—272.1 **7 Claims**

1. A stopper assembly adapted for use in connecting a container with one component therein to a piston and cylinder type syringe assembly with a liquid component therein, with the components initially separated by the stopper assembly prior to permissive mixing of the components in the container upon manipulation of the stopper assembly; and comprising a centrally bored first stopper adapted for insertion in the container opening and receiving the syringe access fitting in the bore thereof; and a second stopper passing into the adjacent end of the said bore for sealing the bore and the opening to the syringe fitting whereby to maintain the components separated when the container and syringe assembly are mounted to the

stopper assembly; said second stopper being releasable from its connection with the first stopper to drop into the container



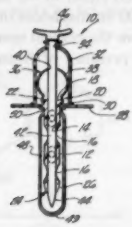
when the syringe piston is urged inwardly whereby to permit the component in the syringe to access to the component in the container for mixing therein.

4,153,058

PLEURAL DECOMPRESSION CATHETER

Alexander E. Nehme, 6335 Brewer Rd., Flint, Mich. 48507

Filed Jul. 5, 1977, Ser. No. 812,608
Int. Cl.[2] A61M *27/00*; A61B *17/34*
U.S. Cl. 128—347 **7 Claims**



1. A pleural decompression catheter comprising,

an elongated member adapted to be inserted into a human body so that one end of the elongated member extends outwardly from the body, said elongated member having fluid passage means formed therein for establishing fluid communication between at least one point on the exterior of said member and said end of said member whereby upon insertion of said member in the body, entrapped air within the human body can be exhausted through said fluid passage means and exteriorly of the body;

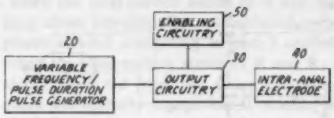
one-way valve means coupled to said end of said member for permitting fluid flow from said passage means and through said valve means; wherein said passage means comprises an axial throughbore in said elongated member, and said catheter further comprises a trocar removably inserted through said throughbore and said valve means so that said trocar extends outwardly from the other end of said elongated member to thereby aid in inserting said member into said body, said trocar having a diameter substantially equal to the diameter of said throughbore so that the entire periphery of the inserted portion of the trocar abuts against the wall defining said axial throughbore.

4,153,059

URINARY INCONTINENCE STIMULATOR SYSTEM

Ralph P. Fravel, and Ciril J. Godec, both of Saint Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 25, 1977, Ser. No. 844,966
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—422 **9 Claims**



1. A urinary incontinence stimulator system having an intra-anal electrode including:

a generator means for providing a series of pulses of a duration and frequency which vary in a psuedo-random fashion;

an enabling means for providing a recurring enabling signal; and

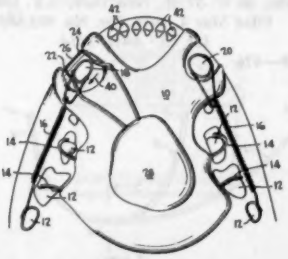
an output circuit means connected to receive said pulses from said generator means and said enabling signal from said enabling means for enabling said output circuit for a time determined by said enabling signal for providing a series of pulses to the intra-anal electrode of the system in response to said pulses received from said generating means during said time.

4,153,060

METHOD AND APPARATUS FOR ELECTRICALLY ENHANCED BONE GROWTH AND TOOTH MOVEMENT

Edward Korostoff, Philadelphia, Pa., and Zeev Davidovitch, Cherry Hill, N.J., assignors to University of Pennsylvania, Philadelphia, Pa.

Filed Mar. 15, 1978, Ser. No. 886,775
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 F **16 Claims**



1. A method of repositioning a tooth in the mouth of a patient, said method comprising the steps of:

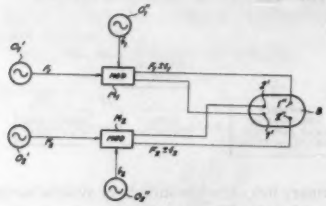
applying a substantially anodic surface electrode in the vicinity of said tooth to be repositioned, said anode electrode applied substantially at a point towards which said repositioning is desired and applying a substantially cathodic surface electrode in the vicinity of said tooth to be repositioned, said cathode electrode applied substantially opposite said anodic electrode; and

causing a current to flow between said surface electrodes to cause repositioning of the tooth.

4,153,061
ELECTROTHERAPEUTIC APPARATUS

Hans Nemec, Ausstrasse 1, Rankweil, Austria

Filed Oct. 20, 1977, Ser. No. 843,953
Claims priority, application Austria, Oct. 21, 1976, 7848/76
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—420 A 10 Claims



1. A method of electrotherapeutically treating a human or animal body, comprising the steps of:

generating a first and a second carrier frequency in a range between substantially 1,000 and 10,000 Hz.;

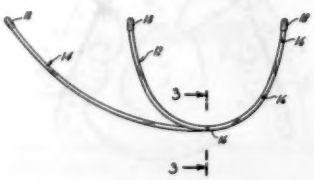
amplitude-modulating said carrier frequencies with respective low frequencies of up to about 200 Hz.; and

simultaneously passing the amplitude-modulated carrier frequencies over separate but intersecting paths through the body to be treated for stimulating selected surface areas of said body by the amplitude modulation while producing stimulation-inducing beat frequencies in the interior of said body at the intersection of said paths.

4,153,062
BRASSIERE UNDERWIRE CONSTRUCTION AND METHOD

Victoria Delet, 60 W. 57 St., New York, N.Y. 10019

Filed May 4, 1978, Ser. No. 902,680
Int. Cl.[2] A41C *1/14*
U.S. Cl. 128—476 5 Claims

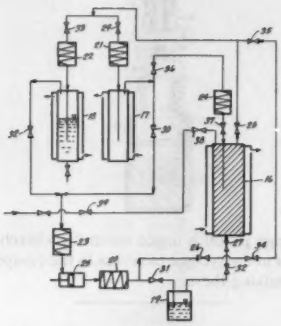


1. An underwire for use in a brassiere, said underwire comprising a semi-rigid U-shaped member dimensioned to be positioned under a bustcup in a brassiere, and a semi-rigid extension member, one side of said extension member conforming in dimension to a portion of the U-shaped member and overlaying said U-shaped member, the other side of said extension member extending away from the lower portion of said U-shaped member outwardly therefrom in position to extend under the wearer's arm and means securing said U-shaped member to said extension member in said overlaying area.

4,153,063
PROCESS FOR THE EXTRACTION OF NICOTINE FROM TOBACCO

Wilhelm Roselius, Magnus; Otto Vitzthum, Bremen, and Peter Hubert, Bremen-Lesum, all of Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mülheim, Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 177,220, Sep. 2, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 390,967
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1970, 2043537; Aug. 23, 1971, 2142205
Int. Cl.[2] A24B *3/14*
U.S. Cl. 131—143 32 Claims



1. A process for the selective aroma preserving extraction of nicotine from tobacco with normally gaseous solvents characterized in that the tobacco is extracted with the said solvent in the presence of at least 10% by weight of moisture based on the weight of the tobacco either in the liquid state at a pressure of from about 65 to 300 atmospheres or in the supercritical state at a temperature from the critical temperature of the solvent to about 100° C. at a pressure of from about 70 to 1500 atmospheres.

4,153,064
CIGARETTE FILTERS

Hideo Sawada, and Junji Kawamoto, both of Sakai, Japan, assignors to Daicel Ltd., Osaka, Japan

Continuation of Ser. No. 595,027, Jul. 11, 1975, abandoned, which is a continuation of Ser. No. 427,028, Dec. 13, 1973, abandoned. This application Apr. 20, 1977, Ser. No. 789,083
Int. Cl.[2] A24D *1/00*; A24B *15/00*
U.S. Cl. 131—267 16 Claims

1. A cigarette filter comprising a rod of cellulose acetate fibers impregnated with from 1 to 20 percent by weight, based on the weight of said cellulose acetate fibers, of ethyl levulinate, said cigarette filter having a hardness of less than 10 units after curing at room temperature for one hour, wherein hardness is measured by applying a load of 300 g on a sample rod by means of a disc having a diameter of 12 mm for 10 seconds and measuring the depth of the indentation thereby formed in the sample rod, and wherein a hardness unit is equal to 0.1 millimeter.

4,153,065

AZO DERIVATIVES OF PYRIDINE N-OXIDE FOR USE IN HAIR DYE COMPOSITIONS

Gérard Lang, Epinay-Sur-Seine, France, assignor to L'Oreal, Paris, France

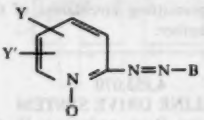
Continuation-in-part of Ser. No. 659,145, Feb. 18, 1976, abandoned, which is a division of Ser. No. 370,651, Jun. 18, 1973, Pat. No. 3,955,918. This application Jun. 15, 1977, Ser. No. 806,817

Claims priority, application Luxembourg, Jun. 19, 1972, 65539

Int. Cl.[2] D06P *3/00*; A45D *7/00*

U.S. Cl. 132—7 16 Claims

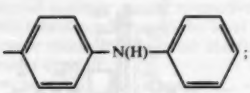
1. A dye composition for human hair comprising a solution in a solvent selected from the group consisting of water and aqueous alcohol solution of about 0.001–1 percent by weight of at least one dye selected from the group consisting of



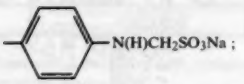
(I)

wherein Y and Y' each represent hydrogen, halogen, lower alkyl having 1–4 carbon atoms, lower alkoxy having 1–4 carbon atoms, nitro or carboxyl;

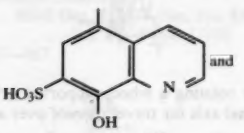
B represents a member selected from the group consisting of



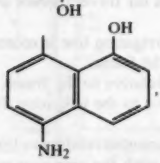
(a)



(b)



(c)



(d)

said composition having a pH ranging from 3–9.5.

4,153,066

METHOD OF REDUCING FRICTION LOSS

Thomas J. Griffin, Jr., Sand Springs, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 656,675, Feb. 9, 1976, abandoned, and a continuation-in-part of Ser. No. 698,666, Jun. 22, 1976, Pat. No. 4,031,014. This application Jul. 15, 1977, Ser. No. 816,111

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.[2] F17D *1/16*

U.S. Cl. 137—13 37 Claims

1. A method of reducing the friction loss generated by an organic liquid selected from the group consisting of aliphatic hydrocarbons, aliphatic halogenated hydrocarbons, and crude oil, flowing through a confining conduit, which comprises:

mixing up to about 0.9 gallon per 1000 gallons of said organic liquid of an organic phosphate ester reaction product comprising the reaction of

A. a pentavalent phosphorus compound selected from the group consisting of P_2O_5 and a mixture of P_2O_5 with polyphosphoric acid;

B. a hydroxy ether of the formula ROR_1OH wherein R is a C_1 to C_6 alkyl group, R_1 is a C_2 or C_3 alkylene group and the total carbon atoms of R and R_1 range from 3 to about 8; and

C. when the total carbon atoms of R and R_1 is 3 or 4, a long chain substantially unsubstituted monohydric aliphatic alcohol containing at least 5 carbon atoms, but when the total carbon atoms of R and R_1 is 5 to 8, an alcohol selected from the group consisting of a long chain substantially unsubstituted monohydric aliphatic alcohol containing at least 5 carbon atoms, a short chain substantially unsubstituted monohydric aliphatic alcohol containing from 1 to 4 carbon atoms and a mixture of said alcohols,

the individual mole ratios of the hydroxy ether, the long chain alcohol and the short chain alcohol to total P_2O_5 being within the ranges of 0.4:1 to 4.5:1; 0:1 to 4.0:1 and 0:1 to 5.0:1 respectively, said reaction being conducted at temperature ranging from about 70° to about 90° C. for a period of time of from about 1.5 to about 6 hours, and,

a sufficient quantity of an aluminum activator compound to provide friction reduction, said aluminum compound being selected from the group consisting of an alkali metal aluminate, aluminum isopropoxide, and hydrated alumina.

4,153,067

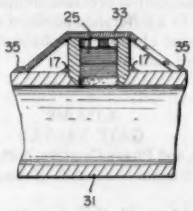
METHOD AND APPARATUS FOR PROVIDING REMOVABLE SERVICE TO CONNECTIONS TO A HIGH PRESSURE MAIN

Charles W. Ray, 5615 Heatherview Dr., Fort Wayne, Ind. 46808

Filed Feb. 4, 1977, Ser. No. 765,521

Int. Cl. F16l *55/10*

U.S. Cl. 137—15 5 Claims



2. The method of permanently severing a Service T from a main comprising:

sealing the Service T interior against the passage of material from the main at an area close to the main said sealing includes screwing a plug into the Service T;

permanently severing a portion of the Service T from the main at an area more remote from the main than the area of sealing; and

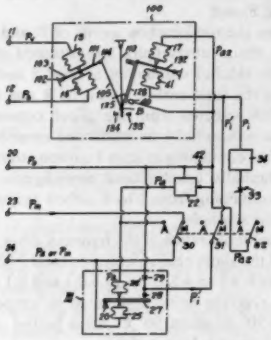
capping the unsevered portion of the Service T, the step of capping including placing a cover over the unsevered Service T portion at the area close to the main and securing the cover to the main.

4,153,068

PNEUMATIC CONTROLLER

Takeshi Yoshida, Musashino, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Nov. 8, 1977, Ser. No. 849,552
Claims priority, application Japan, Nov. 8, 1976, 51/133942
Int. Cl.[2] F15B *5/00*; G05D *16/00*
U.S. Cl. 137—84 **7 Claims**



1. A pneumatic controller comprising:

(a) a proportional band changing mechanism including:
- an input link adapted to receive a deviation input of a set value and a measured value,
- a feedback link adapted to receive a feedback force,
- means for connecting said input link to said feedback link,
- a proportional band changing lever connected to a connecting point of said input link and said feedback link and pivotally supported in-between said links,
- a flapper means adapted to be displaced by the force applied to said feedback link, and
- means for limiting the displacement of a portion of said connecting means within a certain range when an excess deviation force is applied to said input link;

(b) an air injection nozzle cooperating with said flapper;

(c) means for applying a feedback force to said feedback link in response to the back pressure from said nozzle;

(d) means for producing an automatic output pressure in response to a back pressure from said nozzle;

(e) means for transferring said automatic output pressure to a manual output pressure; and

(f) a comparator for comparing said automatic output pressure with said manual output pressure and transmitting an output corresponding to a difference between said pressures to said proportional band changing mechanism through said transfer means in the manual mode.

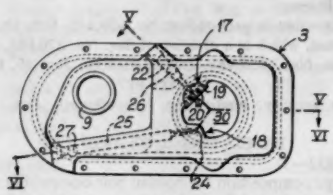
4,153,069

GATE VALVES

Georges Frechou, and Pierre Carriere, both of Toulouse, France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 29, 1976, Ser. No. 745,988
Claims priority, application France, Dec. 17, 1975, 75 38629
Int. Cl.[2] F16K *3/02, 3/30*
U.S. Cl. 137—238 **7 Claims**

1. A valve for insertion in a conduit for carrying fluids such as a liquid fuel having portions of another liquid, having a higher freezing temperature, comprising a housing forming a chamber and defining a passage for said fluid, a closure member movable within said chamber between a position obturating said passage and a position removed therefrom, and a first duct disposed extending from said passage to said chamber for delivery of a portion of said fluid to said chamber and a second duct extending from said chamber to said passage for return of fluid therto, and at least one first obstacle means fixed within said housing and extending into said passage to intercept the flow of fluid, said first obstacle means comprising a wall having orifice on its upstream side for the introduction therein of a portion of said fluid in communication with said first duct,



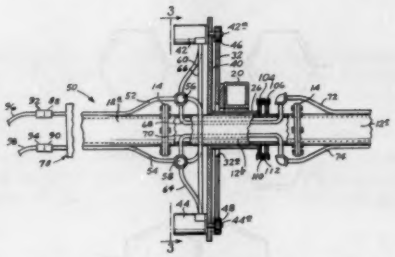
said wall creating a local hydrodynamic pressure difference within said passage permitting circulation of the portion of fluid through said chamber.

4,153,070

PIPELINE DRIVE SYSTEM

Dennis Marcotte, Eugene, Oreg., assignor to Western Irrigation and Manufacturing, Inc., Eugene, Oreg.

Filed Apr. 28, 1976, Ser. No. 680,976
Int. Cl.[2] B05B *3/18*
U.S. Cl. 137—344 **19 Claims**



9. Apparatus for rotating a wheel-supported irrigation line about its longitudinal axis for travel thereof over a field comprising:
- a frame to which the irrigation line is rotatably mounted;
- means for supporting the frame;
- ring gear means fixed relative to the frame;
- arm means fixed relative to the irrigation line and rotatable therewith;
- gear means rotatably mounted relative to the arm means and operatively coupled with the ring gear means; and
- means for driving the gear means rotatably mounted relative to the arm means so that said driven gear means move about the ring gear means to rotate the arm means and irrigation line.

4,153,071

LIQUID APPORTIONING DEVICE

Brent C. Black, and P. Larry Hill, both of Salt Lake City, Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Jul. 27, 1977, Ser. No. 819,647
Int. Cl.[2] G05D *9/04*
U.S. Cl. 137—386 **6 Claims**

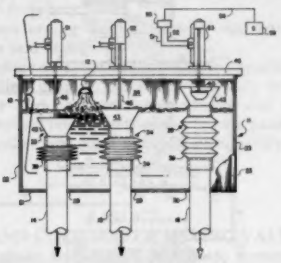
1. A mechanism for selectively and concurrently distributing liquid flow to at least two separate outlet conduits to apportion the liquid flow to devices such as gravity filters, said mechanism comprising:

a. a tank for receiving liquid;

b. first and second outlet conduits connected in flow communication with the liquid contained in said tank;

c. first and second open-ended tubular members mounted in said tank in flow communication with said first and second outlet conduits, respectively said first and second tubular members each including a compressible, upwardly extending bellows-like section having an open upper end;

d. first and second actuator means connected, respectively, to said first and second tubular members for selectively compressing or extending said bellows-like sections to independently determine the elevation of the upper ends



of said tubular members within and above the liquid contained in said tank to determine the liquid flow into the associated outlet conduit; and

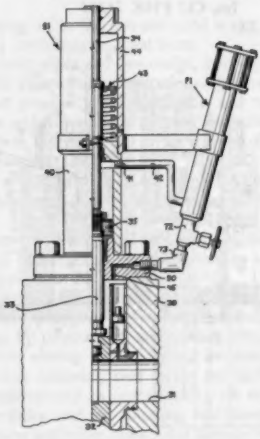
e. first and second sensor means for sensing the level of liquid at a location remote from said tank and means connecting said first and second sensor means to said first and second actuator means, respectively, to activate said actuator means according to the level of liquid sensed by said sensor means to determine the flow into the associated outlet conduit.

4,153,072

PILOT VALVE

David B. Thompson, Lewisville, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 6, 1977, Ser. No. 840,010
Int. Cl.[2] F16K *17/00*
U.S. Cl. 137—467 **25 Claims**



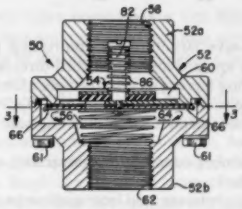
1. A pilot valve for opening and closing a hydraulic cylinder actuated safety valve in a fluid flow system responsive to either of a pressure reduction in said flow system and a failure of an electrical signal applied to said pilot valve comprising: a pilot valve body having a flow passage therein: means in said body providing a first port into said flow passage for communication with said actuator cylinder of said safety valve; means in said body providing a second port communicating with said flow passage for exhaust from said body; a valve assembly including a valve member in said flow passage for controlling flow from said first port to said second port; means in said body operable with said valve assembly for opening said valve assembly responsive to a predetermined low pressure in said flow passage between said first port and said valve member; means in said body operable with said valve assembly for opening said valve member responsive to an electrical signal failure to said pilot valve; and means for closing said valve assembly for resetting said pilot valve to return said pilot valve to service after operation of said pilot valve to close said safety valve.

4,153,073

LIQUID DISPENSING AND VAPOR RECOVERY SYSTEM AND VALVE ASSEMBLY UTILIZED THEREIN

Elmer M. Deters, Muscatine, Iowa, assignor to Wylain, Inc., Dallas, Tex.

Continuation of Ser. No. 721,771, Sep. 9, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,686
Int. Cl.[2] F16K *17/26, 24/00*
U.S. Cl. 137—493.4 **3 Claims**

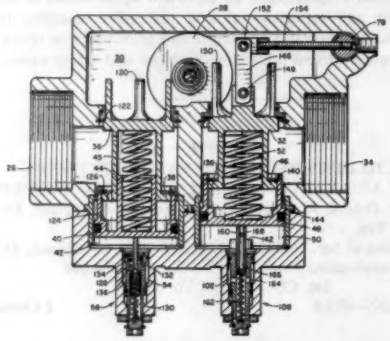


1. A valve assembly for controlling the flow of fluid through a conduit comprising a housing defining an inlet passage for receiving fluid from said conduit, an outlet passage for discharging fluid to said conduit, and a chamber communicating said inlet passage and outlet passage to permit the fluid to flow from said inlet passage through said housing to said outlet passage; a valve seat disposed in said chamber; valve means disposed in said chamber in the path of said fluid and adapted to cooperate with said valve seat for controlling the fluid flow through said housing; and resilient means disposed in said housing for urging said valve means against said seat to prevent the flow of fluid through said housing, said valve means comprising first and second discs of a relatively thin rigid material, a third disc of a relatively thin elastic material sandwiched between said first and second discs, and means permanently securing said third disc between said first and second disc, the diameter of said third disc being greater than that of at least one of said first and second discs so that said elastic material is exposed to said valve seat for engaging same, said discs moving in said chamber against the force of said resilient means in a direction away from said valve seat in response to the fluid pressure differential across said valve means exceeding a predetermined value; a relief valve assembly including a guide member having one end secured to said valve means, said guide member extending outwardly of said valve means toward said inlet, a valve element mounted on said guide member for sliding movement relative to said guide member to and away from said valve means and resilient urging means for resiliently urging said valve element towards said valve means to cover a through opening in said valve means; said valve element moving relative to said guide member against the force of said resilient urging means to uncover said opening in response to fluid pressure in said outlet passage exceeding the fluid pressure in said inlet passage by a predetermined valve.

4,153,074
HYDRAULIC VALVE

Daniel W. Risk, Whittier, Calif., assignor to Maxton Manufacturing Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 332,986, Feb. 15, 1973, abandoned. This application Oct. 18, 1976, Ser. No. 733,679
Int. Cl.[2] F15B *13/043*
U.S. Cl. 137—596.12 **27 Claims**



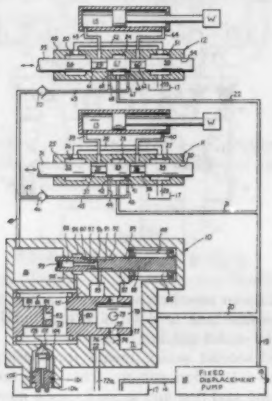
1. Control valve structure for controlling the flow of hydraulic fluid in upward and downward directions comprising:
- a valve housing having an intermediate chamber adapted for connecting said valve structure to a hydraulic pump;
- a first chamber adapted for connecting said valve structure to a tank;
- a second chamber adapted for connecting said valve structure to a jack;
- a bypass valve between said intermediate and first chambers;
- a first, fluid-adjustable, separately movable stop member for controlling the position of said bypass valve;
- a down valve between said intermediate and second chambers;
- a second, fluid-adjustable, separately movable stop member for controlling the position of said down valve;
- first and second actuating chamber means for hydraulically controlling said first and second adjustable stop members, respectively;
- first conduit means for connecting said first actuating chamber means to said intermediate chamber;
- second conduit means for connecting said second actuating chamber means to said first chamber;
- first and second control valve means responsive to the position of said first and second stop members, respectively, for regulating the quantity of fluid in the respective said actuating chamber means;
- levelling valve means for regulating the quantity of hydraulic fluid in said first actuating chamber means; and
- mechanical actuating means connecting said levelling valve means to said down valve whereby operation of said down valve operates said levelling valve means.

4,153,075
LOAD RESPONSIVE CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Filed Nov. 26, 1975, Ser. No. 635,294
Int. Cl.[2] F15B *13/042, 13/08*
U.S. Cl. 137—596.13 **22 Claims**

1. A valve assembly comprising at least one housing having an inlet chamber, a load chamber, an outlet chamber and exhaust means, valve bore means defining an opening in said housing interconnecting said chambers and axially guiding a valve spool, load sensing port means at the region of said valve bore means between said inlet chamber and said load chamber, leakage means interconnecting said load sensing port means and said exhaust means, bypass valve means interconnecting said inlet chamber and said exhaust means, said bypass valve means having flow regulating means to vary bypass flow from said inlet chamber to said exhaust means, said flow regulating means having actuating means operable responsive to control signal transmitted from pilot valve means, said pilot valve means interposed between said inlet chamber and said load sensing port means and having control signal generating means and control signal modulating means, said pilot valve means being in direct communication with said inlet chamber, said control signal modulating means having means responsive to pressure differential between said inlet chamber and said load sensing port means, said pilot valve means operable to control

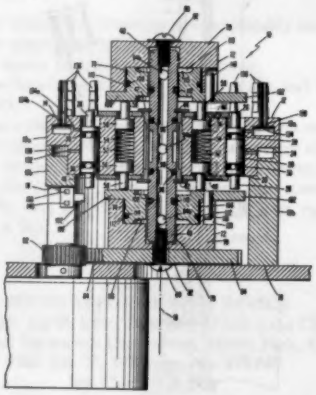


through said actuating means of said flow regulating means bypass flow of said bypass valve means to maintain a constant pressure differential between said inlet chamber and said load chamber under all conditions of operation when said inlet chamber is interconnected to said load chamber by said valve spool and said load chamber is pressurized.

4,153,076
PNEUMATIC VALVE APPARATUS

Roderick J. McNeil, Millis, and Burleigh M. Hutchins, North Attleboro, both of Mass., assignors to Waters Associates, Inc., Milford, Mass.

Filed Dec. 8, 1977, Ser. No. 858,807
Int. Cl.[2] F16K *11/14*
U.S. Cl. 137—624.11 **13 Claims**



1. A valve apparatus comprising:
- a right cylindrical structure formed from a pair of coaxial right cylindrical bodies joined along a central radial plane and having outwardly facing faces in spaced radial planes,
- a plurality of spool valves in said structure located symmetrically about said axis, the spools of said spool valves having axes parallel to the axis of said bodies and subject to mechanical actuation by displacement, each to two

alternate positions along its axis, in one position the valve being open and in the other, the valve being closed,

a spindle extending coaxially through said structure and having two passageways for the flow of air one passageway on each axial side of said central plane,

a pair of pawls carried by said spindle one on each side of said outwardly facing planes for limited axial displacement and rotatable with said spindle about said axis in fixed angular displacement, such that when one pawl is axially aligned with a spool valve, the other is axially misaligned from any valve,

resilient means urging displacement of said pawls axially away from said faces,

means to displace said pawls axially inward against the force of said resilient means toward said outwardly facing faces,

whereby one said pawl may individually and separately drive a selected one of said spools in one axial direction while the other said pawl is displaced inwardly in an idle stroke.

4,153,077

HOT AND COLD WATER MIXING VALVE

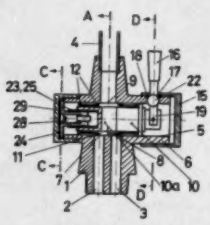
Werner Egli, Eglisau, Switzerland, assignor to Armaturenfabrik Wallisellen AG, Wallisellen, Switzerland

Continuation-in-part of Ser. No. 700,363, Jun. 28, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 761,028

Claims priority, application Switzerland, Jun. 30, 1975, 8476/75

Int. Cl.[2] **F16K** *11/02*

U.S. Cl. 137—625.17 **8 Claims**



1. A mixing valve for hot and cold water comprising:

a housing including an axial bore,

two delivery pipes and one outlet, said pipes and said outlet radially intersecting said bore, within said housing,

a control plunger axially, slidably and rotatably installed within said bore of said housing and being recessed on its periphery intermediate of its ends to form a transverse flow passage,

at least one control element for adjusting the volume of discharge and the discharge temperature of said mixing valve and being operatively coupled to said control plunger for axially shifting said plunger within said bore and for rotating said plunger about its axis,

the improvement comprising:

a net of connected sealing ribs carried on the surface of the control plunger, said recess being surrounded on all sides by portions of said sealing ribs, said net of connected sealing ribs including an inner endless rib net portion outlining said recess on said control plunger periphery and an outer sealing rib net portion spaced therefrom and surrounding said inner endless rib net portion and being connected thereto by spaced longitudinal and transverse connecting sealing ribs, said pipes and said outlet being sized less than the width of said control plunger recess, and

means carried by said housing for adjustably limiting movement of said plunger axially and rotatably and lying outside of said outer endless sealing rib net portion;

whereby, said limitation adjustment means may be adjusted without interrupting water flow to said delivery pipes of said mixing valve.

4,153,078

COMPOSITE VALVE

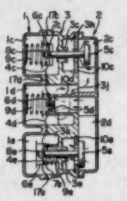
Masami Yamazaki, Toyota, and Masahisa Ando, Aichi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Sep. 30, 1977, Ser. No. 838,305

Claims priority, application Japan, Jun. 13, 1977, 52-76826

Int. Cl.[2] **F16K** *27/02*

U.S. Cl. 137—882 **8 Claims**



1. A composite valve comprising a first dish-like member having an open face and concaved portions which principally define a plurality of diaphragm chambers, a second dish-like member having an open face and concaved portions which principally define complex passages, an intermediate member having opposite open faces adapted to join said open faces of said first and second dish-like members and having complex partitions which principally define bearing portions and complex passages, a diaphragm element interposed between said open faces of said first dish-like member and said intermediate member, a plurality of valve elements having stem portions slidably mounted in said bearing portions and stem end portions connected to said diaphragm element, and valve seat elements interposed between said open faces of said second dish-like member and said intermediate member and providing valve seats which co-operate with said valve element.

4,153,079

FLEXIBLE HOSE LINES

John Ambrose, Birmingham, England, assignor to Dunlop Limited, Great Britian

Filed Apr. 15, 1975, Ser. No. 568,316

Claims priority, application United Kingdom, Apr. 19, 1974, 17370/74

Int. Cl.[2] **F16L** *55/00*

U.S. Cl. 138—104 **20 Claims**

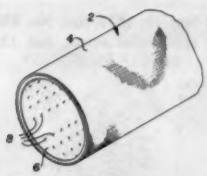
1. A flexible hose line comprising a main fluid retaining reinforcement carcass, a secondary radially expansible fluid retaining carcass having reinforcement material and enclosing the outside of the main carcass along at least part of the length thereof and, a means for effecting a fluid tight seal between the ends of the secondary carcass and said main carcass wherein upon fluid leakage from the enclosed main carcass the secondary carcass expands radially while preventing escape of the fluid.

4,153,080

FIRE HOSE AND METHOD OF MAKING IT

William S. Murray, Jr., Rumson, and Clarence W. Borden, Trenton, both of N.J., assignors to Goodall Rubber Company, Trenton, N.J.

Filed Apr. 13, 1978, Ser. No. 896,113
Int. Cl.[2] F16L *11/12, 11/02*
U.S. Cl. 138—126 21 Claims



1. A weeping hose, comprising,

an external exposed tubular jacket formed of water absorbent textile material, said jacket being formed of intertwined strands of textile material in contact with each other to present no visible openings in said jacket,

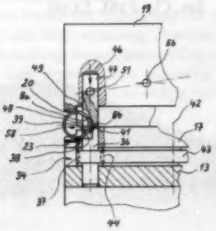
an internal elastomer tube lying against the interior surface of said jacket, said tube having a wall formed of water impermeable material, spaced apart sets of radiating cracks in said wall for releasing water into said jacket, said cracks having edges which are normally in contact with each other but are separable to permit water to pass therebetween when the tube is subjected to internal hydrostatic pressure, said sets of cracks being spaced apart a distance to produce wetting of substantially all of the external jacket when the interior of the hose is subjected to hydrostatic pressure.

4,153,081

APPARATUS FOR SEVERING AND DEFORMING THE ENDS OF HELICAL BINDERS FOR PADS OR THE LIKE

Jörn-Uwe Lemburg, and Dieter Stolley, both of Hamburg, Fed. Rep. of Germany, assignors to E.C.H. WILL (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 821,177, Aug. 2, 1977, Pat. No. 4,095,623. This application Apr. 20, 1978, Ser. No. 898,336
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703718
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.
Int. Cl.[2] B21F *35/02*
U.S. Cl. 140—92.7 18 Claims



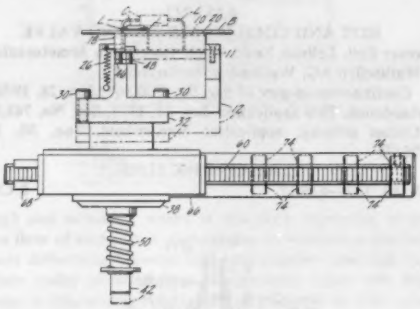
1. Apparatus for deforming at least one end convolution of a helical binder which is threaded through the openings of a stack of loose leaves or the like, comprising a locating device having means for holding at least one end convolution of a binder in a predetermined position; a tool having means for bending the free end portion of the end convolution over the neighboring convolution of the binder occupying said position; a hold-down device; means for moving said hold-down device between the end convolution and the neighboring convolution of the binder occupying said position; a loop forming device; and means for actuating said loop forming device so as to convert the bent end portion of the end convolution of the binder occupying said position into a loop which surrounds the neighboring convolution, said hold-down device having a first guide face and at least one of the other two devices having a second guide face which cooperates with said first guide face to define a channel confining the end portion of the end convolution during conversion into said loop.

4,153,082

CUT-CLINCH MECHANISM FOR VARIABLY SPACED LEADS

Michael S. Foley, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Apr. 19, 1978, Ser. No. 897,781
Int. Cl.[2] B21F *11/00*
U.S. Cl. 140—105 11 Claims



1. Cut-clinch mechanism for operating on the variably spaced leads of components mounted on a circuit board or the like, said mechanism comprising means for pivotally supporting a pair of levers for rotation in opposite directions about an axis substantially parallel to the board, the means including a through-opening and an axially extending through-slot aligned therewith, one of the levers having a lead-receiving hole movable into and out of angular alignment with said through-opening and the other of said levers having an axially extending slot movable into and out of angular alignment with said through-slot, mechanism for moving the support means relative to the board to cause end portions of the leads of a component projecting therefrom to extend into the aligned hole and through-opening on the one hand and the aligned slots on the other hand, and other mechanism for counter-rotating the levers about said axis to cut the leads in cooperation with said support means and then bend and wipe the shorn lead portions in opposite directions against the circuit board.

4,153,083

PROCESS AND ARRANGEMENT FOR FILLING GAS CYLINDERS

Jacques Imler, CH-3034 Murzelen, Canton of Bern, and Karel Masek, Landorfstrasse 40, CH-3098 Koeniz, Canton of Bern, both of Switzerland

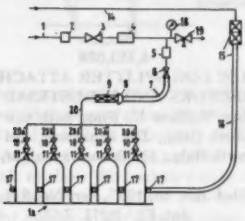
Continuation of Ser. No. 657,408, Feb. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 477,495, Jun. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 315,164, Dec. 14, 1972, abandoned. This application Nov. 11, 1977, Ser. No. 852,599
Claims priority, application Switzerland, Dec. 15, 1971, 18259/71
Int. Cl.[2] B65B *31/00*
U.S. Cl. 141—4 15 Claims

1. An improved method of filling a vessel with compressed gas,

the method being of the type wherein
the inlet of a vessel to be filled with compressed gas is connected to a compressed-gas feed line to form a gas feed path leading into the interior of the vessel, to thereby feed gas into the vessel causing the weight and pressure of gas within the vessel to rise until the vessel has been filled,
the improvement comprising

(a) connecting the inlet of the vessel to the gas feed line through the intermediary of a flow restrictor, the flow restrictor having a flow cross-section which is smaller than the flow cross-section of the gas feed path upstream of the flow restrictor;

(b) filling the vessel with compressed gas by forcing compressed gas through the gas feed line and through the flow restrictor into the interior of the vessel, whereby the weight and pressure of compressed gas in the vessel increase during the course of the filling operation;



(c) during the entirety of the filling operation using pressure regulation to keep constant with respect to time the gas pressure in the part of the gas feed path upstream of the flow restrictor, including the gas feed line and all the way through and to the point in the gas feed path immediately upstream of the flow restrictor; and

(d) during the entirety of the filling operation keeping the gas feed path, including the constant-pressure gas feed line and going all the way through the flow restrictor into the interior of the vessel, unblocked for gas flow in the direction into the vessel, whereby compressed gas passes from the constant-pressure gas feed line through the flow restrictor and into the vessel so long as the gas pressure downstream of the flow restrictor is lower by at least a predetermined amount than the pressure upstream of the flow restrictor.

4,153,084

MACHINE FOR USE IN FABRICATING PANELS FILLED WITH PULVERIZED INSULATION MATERIAL

Joe J. Payne, 1505 Daniels Ave., Escalon, Calif. 95320

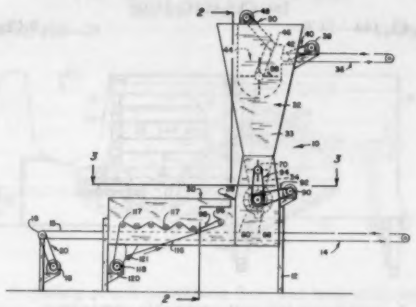
Filed Jul. 21, 1977, Ser. No. 817,803
Int. Cl.[2] B65B *1/24*
U.S. Cl. 141—80 **11 Claims**

1. In a machine for use in fabricating panels filled with an insulation material of a substantially pulverized texture, the improvement comprising:

A. endless conveyor means for transporting at a linear velocity along a horizontally oriented path a panel component having an upwardly facing open side for receiving insulation material;

B. metering means disposed above said path for introducing into the panel compressible insulation material; and

C. packing means for compressing said insulation material in said panel component, as the panel component is transported by said conveyor means at said linear velocity including a series of rollers of substantially cylindrical configurations disposed above and transversely related to said path, each of said rollers being characterized by radially extended flexible bristles having lengths such that the bristles project downwardly into the open side of the panel component as the component is transported beneath the roller for applying to material introduced into the component downwardly acting compressive forces, and drive means connected to said plurality of rollers for driving the rollers at angular velocities such that the



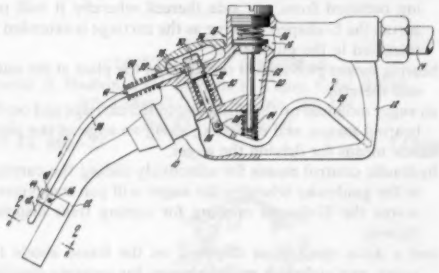
surface velocity of each of the rollers corresponds to the linear velocity of the panel component as it is transported by the conveyor means.

4,153,085

FUEL DISPENSING NOZZLE

Leon Adams, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 18, 1978, Ser. No. 906,962
Int. Cl.[2] B65B *3/04;* **B67D** *5/37*
U.S. Cl. 141—311 R **1 Claim**



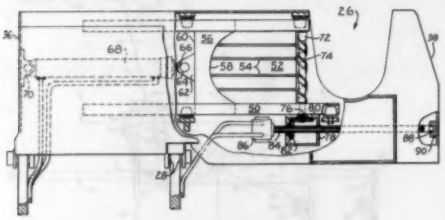
1. A fuel dispensing nozzle for dispensing fuel into a fuel tank having a fill tube and a restrictor plate secured in said fill tube and having an aperture slightly larger than said nozzle, said dispensing nozzle comprising; a handle, a lever and a valve mechanism for controlling fuel dispensing; a fuel delivery tube extending from said handle; a fulcrum slidably mounted in said handle and pivotally connecting said lever to said handle and being movable by said lever between an operative position wherein said lever will operate said valve and an inoperative position wherein said lever will not operate said valve; a control aperture in said fulcrum; and a fulcrum control mechanism comprising a support secured to said fuel delivery tube; a control rod having one end slidably mounted in said support and the other end slidably mounted in said handle adjacent the control aperture in said fulcrum, and spring means urging said rod toward said support and removed from said control aperture so that said fulcrum is free to move to said inoperative position, said control rod being movable by abutment with said restrictor plate when said fuel delivery tube is inserted through said aperture, said movement being sufficient to engage said control rod in said control aperture so that said fulcrum will be held in said operative position whereby said valve mechanism can be operated by movement of said lever.

4,153,086

AUGER-TYPE TREE CUTTER

Dorrance Oldenburg, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 25, 1976, Ser. No. 699,758
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—34 R **9 Claims**



1. An auger-type tree cutter assembly comprising:

a frame adapted for mounting on a vehicle for movement into close association with standing trees; comprising an elongated generally rectangular box-like configuration having a U-shaped opening provided in one side thereof and including spaced upper and lower plates defining said U-shaped opening, spaced parallel guide members disposed between said plates normal thereto, to define a carriage guideway together with said upper and lower plates,

an elongated carriage member, a portion of which is slidably and telescopically disposed within said carriage guideway whereby the carriage will extend beyond the U-shaped opening along a side thereof,

a plate mounted on the distal end of the carriage and extending outward from one side thereof whereby it will pan across the U-shaped opening as the carriage is extended or retracted in the guideway,

bearing means provided at one edge of the plate at the outer end thereof,

an auger mounted on the distal end of the carriage and on the bearing means, and extending along an edge of the plate,

motor means for driving the auger,

hydraulic control means for selectively sliding the carriage in the guideway whereby the auger will pan transversely across the U-shaped opening for cutting trees disposed therein,

and a drive mechanism disposed on the frame above the auger, and including grapple means for securing standing trees for cutting by the auger.

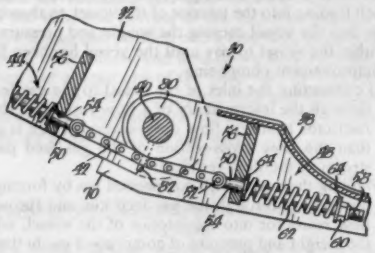
4,153,087

ACCUMULATOR MECHANISM FOR TREE HARVESTING APPARATUS

Terry A. Stoychoff, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed May 12, 1978, Ser. No. 905,136
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—34 E **6 Claims**

1. In a tree harvesting apparatus having support means, grapple means and cutter means on said support means, and accumulator means on said support means, said accumulator means including first and second spaced tree engaging elements fixed to said support and an accumulator arm having one end pivoted on said support between said tree engaging elements, said accumulator arm including a first portion having one end pivoted on said support means with a second portion pivotally connected to the free end of said first portion and biasing means normally maintaining said portions in end-to-end relation and accommodating pivotal movement about the pivotal connection, said biasing means including a flexible element having an intermediate portion entrained over the pivotal connection, first spring means between said first portion and one end of said flexible element and second spring



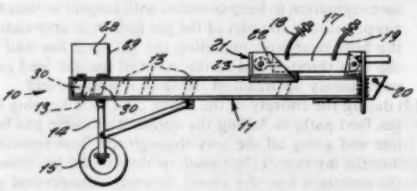
means between said second portion and the opposite end of said flexible element.

4,153,088

HYDRAULIC LOG SPLITTER ATTACHMENT FOR FARM TRACTORS AND INDUSTRIAL TRACTORS

William L. King; William U. King, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, all of, New York, N.Y. 10007

Filed Jun. 30, 1977, Ser. No. 811,696
Int. Cl.[2] B27L *7/00*
U.S. Cl. 144—193 A **2 Claims**



1. In a hydraulic log splitter attachment, the combination of a frame with an upper surface comprised of a pair of opposing parallel, spaced apart metal channels with web members separated by a row of inclined spaced apart spacers welded to said web members, one end of said frame supported upon legs having wheels, and opposite end of said frame having a bolt mounting opening therethrough for attachment to a tractor or other hydraulic power source, a hydraulic cylinder mounted axially upon said opposite end of said frame, a ram and a piston rod connected to said hydraulic cylinder, said cylinder having hydraulic lines extending therefrom for connection to said power source, the first said end of said frame adjustably supporting a splitter block having downward inclined feet for placement selectively between said spacers, and said splitter block being wedge-shaped with a blade edge thereof facing toward said ram, said ram slidably engaging said frame, so to force a cord wood log placed between said ram and said splitter block against said splitter block blade edge so to split said log, said block having a lower surface engaging said upper surface for support, including means on said block to cut the log at right angles to said blade edge.

4,153,089

FLEXIBLE CONTAINER FOR STORING SAND

Roger L. Veilleux, 67 S. Whitney St., Hartford, Conn. 06106

Filed May 22, 1978, Ser. No. 908,157
Int. Cl.[2] B65D *29/00*
U.S. Cl. 150—7 **13 Claims**

1. A container of the type which may be used for storing sand and which may be stored in a motor vehicle and used to

apply sand to an area near the drive wheels of the motor vehicle which is stuck in the snow, ice or mud, the container comprising:

(a) a generally circular bottom;

(b) an elongated frustoconically shaped body portion extending from said bottom and terminating in a pouring spout; and

(c) the body being made of a plastic coated fabric material having a weight between about 15 and 25 ounces per square yard and which is sufficiently stiff to allow the elongated body to function as a chute but being sufficiently flexible to allow the container to be folded over at a postion intermediate the bottom and the pouring spout to provide for closing of the pouring spout.

4,153,090

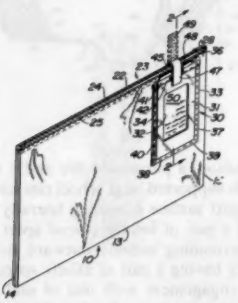
REUSABLE TRANSIT CONTAINER

Arnold S. Rifkin, 1400 Sans Souci Pkwy., Wilkes-Barre, Pa. 18703

Filed Jul. 24, 1978, Ser. No. 927,636

Int. Cl.[2] A45C *11/00*

U.S. Cl. 150—15 **6 Claims**



1. A reusable transit container comprising a pair of facing back and front walls marginally secured together except along adjacent edge portions defining a mouth, complementary slide fastener elements secured along said mouth defining adjacent edge portions, a slider slidable on said slide fastener elements between one end of said adjacent edge portions to open the latter and the other end of said adjacent edge portions to close the same, a message holder on one of said walls adjacent to said other end of said adjacent edge portions and having an opening facing toward said adjacent edge portions for insertion and removal of a message, a closure tie secured to the other of said walls and removably extending to a closing position over said slide fastener elements and said holder opening, and detachable connection means on said holder and closure tie for releasably retaining the latter in said closing position.

4,153,091

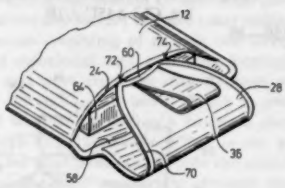
MAILING POUCH

Gerhard Jahn, 133 Richmond St. West, Toronto, Ontario, Canada (M5H 2L7)

Filed Apr. 7, 1978, Ser. No. 894,426

Int. Cl.[2] B65D *33/24*

U.S. Cl. 150—21 **16 Claims**



1. A mailing pouch comprising front and back walls joined at their sides and bottom to define a pouch mouth between top edges of said front and back walls, a pouch mouth closure flap with inner and outer surfaces being integral with one of said pouch walls and having a hinge area at the juncture of flap base and pouch wall, said flap having a resilient portion associated therewith which extends from said hinge area to at least proximate the leading portion of said flap, pull tab means secured near the leading flap portion and to the flap's outer surface, said pull tab extending towards the flap's base, said resilient portion being sufficiently flexible to permit insertion of and withdrawal of said flap into and from said pouch mouth whereby with said flap in mouth closure position said pull tab is located between the pouch wall and the flap to provide a hand grasp in overcoming initial resistance by said resilient portion to flap pull out.

4,153,092

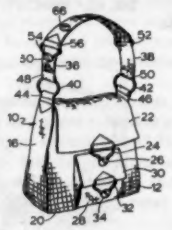
CONVERTIBLE HANDBAG

Beverly J. Haslam, 1392 Merritt, El Cajon, Calif. 92021

Filed May 3, 1978, Ser. No. 902,439

Int. Cl.[2] A45C *9/00*

U.S. Cl. 150—33 **7 Claims**



1. A bag having front, back and side walls connected to a bottom and defining a compartment having an open top, in combination with carrying apparatus enabling said bag to be converted to multiple carrying modes, said carrying apparatus comprising:

first and second straps having inner and outer ends, each strap connected at the inner end to said bag adjacent the top and a side thereof, and including a button loop on the outer end thereof,

a first pair of buttons, one attached to each of said pair of straps for cooperative engagement with a button loop for defining a unitary carrying strap and a handbag mode, a second pair of buttons attached to the back wall of said bag for separately cooperating with individual ones of said button loops for defining a back-pack mode of carrying said bag and for engagement with button loops on individ-

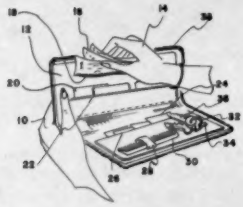
ual straps from a second like bag for defining with said second bag a saddle bag mode.

4,153,093

BILLFOLD AND SMALL ITEM HOLDER

Vanda J. Mahabir, Ottawa, Canada, assignor to Raymond Lee Organization, Inc., New York, N.Y.

Filed Jun. 15, 1976, Ser. No. 696,319
Int. Cl.[2] A45C 1/06
U.S. Cl. 150—35 **2 Claims**



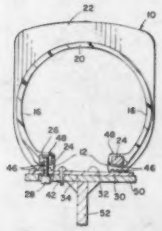
1. An improved billfold and small item holder, comprising:
a foldable billfold,
a zipper attached around an edge of the billfold, whereby the billfold may be closed,
a zippered money compartment attached to an upper inside surface of the billfold,
a pocket extending across a lower portion of a front of the money compartment attached to the front of the money compartment,
a pocket attached to a lower portion of the inside of the billfold,
a loop attached to a front of the lower pocket, whereby a comb may be removably secured to the billfold, and
a key ring secured to the front of the lower pocket.

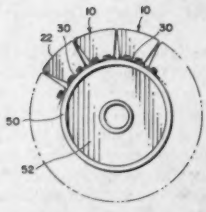
4,153,094

SECTIONAL TIRE

Ross A. McKenzie, 2 Brule Ter., Toronto, Ontario, Canada (M63 1M3)

Filed Feb. 28, 1977, Ser. No. 772,359
Int. Cl.[2] B60C 19/00
U.S. Cl. 152—334 **12 Claims**





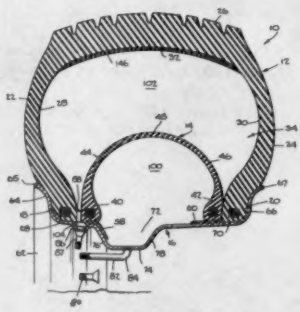
1. In a tire section apparatus individually securable to a wheel rim with other tire sections to form a tire having sections that are replaceable when worn or damaged, the improvement comprising substantially flexible pneumatic tire section means extending from a circular open bottom area into side walls, and a tread surface, said bottom area lying in a flat plane positionable next adjacent to a tire rim surface lying in a circumferential plane transversely extending from a wheel sealing adaptor plate means removably sealable to said tire section at said bottom area, circular steel ring mounting means substantially around the periphery of said bottom area for securing said tire section means next adjacent to a wheel rim through said adaptor plate and for substantially equal distribution of stress through said circular steel ring due to the lateral, forward or backward movement of a vehicle on which said tire section is mounted and to assure the seal of said tire section to said adaptor plate when said stress is applied to said tire section, said circular steel ring mounting means being integral with said tire section means, sealing means for removably securing said sealing adaptor plate means to said bottom area, said sealing means operatively engaging said circular steel ring mounting means.

4,153,095

PNEUMATIC TIRE HAVING A PNEUMATIC SAFETY INSERT WITH BEADS

Berge Sarkissian, Waterbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,109
Int. Cl.[2] B60C 5/06, 17/00, 5/08
U.S. Cl. 152—340 **41 Claims**



1. In combination, a pneumatic tire and a wheel rim upon which the tire is supported, said wheel rim having an axis and an annular support surface extending laterally in the direction of the axis and a pair of axially spaced apart annular flanges joined to and extending radially outward from said support surface, said tire having a pair of axially spaced apart annular beads each in engagement with one of said flanges and the support surface with a pair of sidewalls each joined to and extending generally radially outward from the beads, and a tread joined to the radially outward ends of the sidewalls, said tread and sidewalls having continuous inner surfaces such that said tire and said wheel rim support surface form a closed toroidal tire cavity, a generally toroidal shaped hollow pneumatic insert member disposed within said tire cavity on the support surface of said wheel rim to define an insert inflation chamber inflatable to a first predetermined rated inflation pressure and a tire inflation chamber in said tire cavity between said tire and said insert member, said insert comprising, a generally toroidal shaped hollow member having a pair of annular insert beads, each said insert bead being axially spaced apart a predetermined amount on said support surface, said insert having an unconnected open portion between said insert beads, said insert beads having a diameter greater than the diameter of the support surface, a pair of insert sidewalls, each

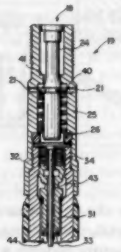
joined to and extending generally radially outwardly from said insert beads and an insert crown portion joined to the radially outward ends of the insert sidewalls, the sidewalls of said insert having inner and outer wall surfaces and an annular flap portion joined to each said outer sidewall surface of the insert between the insert bead and the insert crown and extending beyond each insert bead a predetermined amount for tucking between the respective insert beads and the wheel rim support surface to overlay the support surface, the flap thickness and insert bead diameter being predetermined to ensure formation of a leak-tight seal between the insert beads and the support surface when respective said flaps are tucked between respective said beads and the support surface, said insert inflation chamber being noncommunicable with said tire inflation chamber to permit said tire inflation chamber to be pressurized to a second predetermined rated inflation pressure different from the first predetermined rated inflation pressure of the tire, said insert member having a radially outward crown portion spaced from the inner surface of the tire tread where the tread contacts a road surface, said tire having a no-load section height measured from the road contacting tread portion to the wheel rim flange when the tire is at said second predetermined rated inflation pressure and not supporting a load, said tire having a rated load section height measured from the road contacting tread portion to the wheel rim flange when the tire is at said second predetermined rated inflation pressure and is supporting its rated load, and a run-flat section height measured from the road contacting tread portion to the wheel rim flange when the tire air chamber is deflated and said insert air chamber is at said first predetermined rated inflation pressure, said insert having a predetermined size range relative to the tire wherein the difference between the no-load section height and the run-flat section height is approximately 43% to 64% of the no-load section height.

4,153,096

APPARATUS FOR INTRODUCING PRESSURIZED GAS INTO A TIRE

Norbert A. Kirk, 2970 Sheridan Rd., Chicago, Ill. 60657

Filed Nov. 10, 1976, Ser. No. 740,738
Int. Cl.[2] B60C *21/10*
U.S. Cl. 152—415 **4 Claims**



1. An apparatus in combination with a tire for introducing air under pressure from a pressurized source of air into a tire that has a valve having a valve stem for admitting air into said tire, the source of pressurized gas including a nozzle, said apparatus comprising:

an elongate hollow stem, circular in cross section, having a cylindrical wall defining a main passageway having a source end and a tire end for interconnecting the source of air with the tire;

an elongate member mounted for axial movement within said stem in said main passageway;

means for securing said tire end of said hollow stem to said valve stem of said valve;

spring means urging said elongate member into a first, withdrawn position in said main passageway, said elongate member being movable, in said main passageway, against said spring means into a second, extended position for opening the tire valve to permit introduction of the pressurized air through said main passageway, through said valve, and into the tire;

an outer sealing means located in said main passageway for preventing the exhaust of air through the source end of said elongate hollow stem when said elongate member is in said withdrawn position;

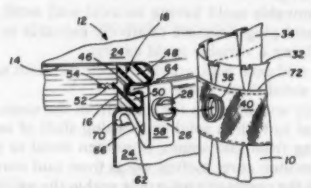
and vent means permanently open to the atmosphere for constantly venting the portion of said main passageway between said tire end thereof and said outer sealing means, said vent means consisting of at least one straight bore through said cylindrical wall, each bore forming a bleed aperture in said stem extending directly from said main passageway through said cylindrical wall to atmosphere outside said wall, said bores each having a diameter of from 1/16 inch to 3/32 inch, such that, in use, gas introduced into said main passageway from the source is bled directly from the main passageway through each bleed aperture to atmosphere while gas from the source is simultaneously introduced into the tire through said passageway, the apparatus being free of means for obstructing the flow of gas through the bleed aperture or apertures.

4,153,097

SKIRTING SUPPORT SYSTEM

Hugh G. Pettibone, 4441 Mockingbird Ln., Dallas, Tex. 75205

Filed Jul. 6, 1977, Ser. No. 813,349
Int. Cl.[2] A47H *1/00*
U.S. Cl. 160—330 **6 Claims**



1. A skirting support system for mounting a skirt to a peripheral edge of an article comprising:

a plurality of resilient clips, each of said clips including;

a face portion having outer and inner surfaces;

an upper extension having top and bottom surfaces and transversely intersecting said inner surface of said face portion;

a lower extension having top and bottom surfaces, being spaced apart from said upper extension and transversely intersecting said inner surface of said face portion;

said lower extension further including an end member terminating in a curvilinear portion; and

first fastener means disposed at said outer surface of said clip face portion;

a flexible elongate track member having upper and lower portions and a centrally disposed elongate slot positioned between said upper and lower portions, said centrally disposed elongate slot having top and bottom surfaces;

said flexible elongate track member being flexible to conform to the contour of the article along the peripheral edge thereof;

means for attaching said flexible elongate track member to the peripheral edge of the article;

each of said plurality of clips frictionally engaging said flexible elongate track member, such that said top surface of said upper extension of said resilient clips engages said top surface of said centrally disposed elongate slot of said flexible elongate track member, said bottom surface of said upper extension of said resilient clips engages said bottom surface of said centrally disposed elongate slot of said flexible elongate track member, said lower portion of

said flexible elongate track member engages said inner surface of said clip face portion, said clip lower extension top surface engages said lower portion of said flexible elongate track member; and

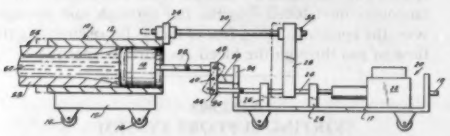
skirting means including second fastener means for detachably coupling to said first fastener means of said plurality of clips, such that said clips and said fasteners are hidden from view by said upper portion of said flexible elongate track member.

4,153,098

STRAIN REDUCTION OR REVERSAL TECHNIQUE FOR CONTINUOUS CASTING OF METALS

Leonard Watts, Jamaica, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jun. 24, 1976, Ser. No. 699,750
Int. Cl.[2] B22D *11/00*
U.S. Cl. 164—83 **12 Claims**



12. A process for continuously casting an elongated metal article, comprising the steps of:

a. introducing molten metal from a source of molten metal into a movable mold having an axial wall mold structure and an end plug structure relatively movable in the mold and defining a variable mold cavity;

b. cooling said axial wall structure of the mold for solidifying molten metal there along;

c. relatively withdrawing the mold from the source of molten metal to form a solidified casting shell of said article extending from said source of molten metal to said mold with a molten core, molten metal from said core flowing through the center of said article within the solidified shell towards the end plug of the mold during casting; and

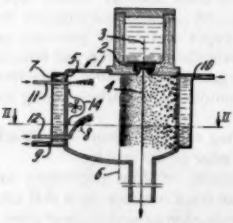
d. relatively oscillating both the axial wall mold structure and the end plug structure with respect to one another whereby compression in the molten metal and its solidification can be selectively controlled.

4,153,099

COOLING FLUID FOR THE MANUFACTURE OF WIRE

Bernard Pflieger, Chamalieres, and André Reiniche, Clermont-Ferrand, both of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Oct. 17, 1977, Ser. No. 842,897
Claims priority, application France, Oct. 15, 1976, 76 31802
Int. Cl.[2] B22D *11/00, 11/124*
U.S. Cl. 164—89 **9 Claims**



1. A cooling fluid for an apparatus for the manufacture of a solid wire by projecting a jet of liquid metal or metal alloy through a nozzle into a cooling enclosure containing the cooling fluid in which the transformation of the liquid jet into solid wire takes place, characterized by the fact that the cooling fluid consists of a mixture of a gas and steam, the gas and the steam being compatible with the jet, the gas furthermore being at a temperature below the condensation point of the steam, so as to transform at least a part of the steam into liquid droplets, said liquid droplets which enter into contact with the jet having diameters which at most equal to 2.5% of the diameter of the wire produced and being selected in suitable diameter by the centrifugation of the cooling fluid in the cooling enclosure.

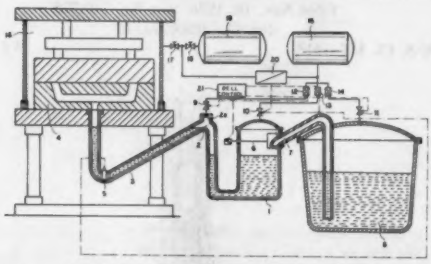
6. An apparatus for the manufacture of a solid wire by projecting a jet of liquid metal or metal alloy through a nozzle into a cooling enclosure containing a cooling fluid in which the transformation of the liquid jet into solid wire takes place, said cooling fluid consisting of a mixture of a gas and steam, the gas and the steam being compatible with the jet, the gas furthermore being at a temperature below the condensation point of the steam, so as to transform at least a part of the steam into liquid droplets, characterized by the fact that the portion of the cooling enclosure adjacent the nozzle has a wall having the shape of a surface of revolution around an axis parallel to the axis of the nozzle and has means for imparting to the cooling fluid a movement of rotation around said axis of revolution, the gas feed being distinct from the steam feed.

4,153,100

LOW-PRESSURE OR COUNTERPRESSURE CASTING APPARATUS

Angel T. Balevski; Ivan D. Nikolov, and Asparuch M. Antonov, all of Sofia, Bulgaria, assignors to Institut Po Metaloznanie I Technologia Na Metalite, Sofia, Bulgaria

Continuation-in-part of Ser. No. 735,220, Oct. 26, 1976. This application Aug. 29, 1978, Ser. No. 937,744
Claims priority, application Bulgaria, Oct. 27, 1975, 31330
Int. Cl.[2] B22D *17/32*
U.S. Cl. 164—155 **2 Claims**



1. An apparatus for the low-pressure and counterpressure casting of a molten metal, comprising:

a mold-support structure having a plate carrying a mold, said plate being formed with an inlet for feeding molten metal into said mold:

a main crucible for receiving molten metal, said main crucible being hermetically sealed and provided with a delivery conduit reaching into the molten metal in said main crucible for transferring the molten metal therefrom;

an intermediate crucible receiving molten metal from said delivery conduit, said delivery conduit opening into said intermediate crucible at a location above the bottom thereof, said intermediate crucible being hermetically sealed and having an outlet disposed below the level at which said delivery conduit communicates with said intermediate crucible;

a siphon conduit having an upwardly extending stretch communicating at its lower end with said outlet, an elbow at the upper end of said upwardly extending stretch substantially at the level of said inlet, a downwardly extending stretch running from said elbow, and a further stretch

rising from said downwardly extending stretch to said inlet of said mold, said elbow being disposed above the level of the molten metal in said intermediate crucible;

a stopper valve along said siphon conduit between said inlet to said mold and said elbow;

a source of an inert gas under pressure;

first control means, second control means and third control means respectively connecting said source with said main crucible, said intermediate crucible and said elbow for regulating the inert-gas pressure therein to displace molten metal from said main crucible to said intermediate crucible and from said intermediate crucible to said mold and for establishing an inert-gas cushion at said elbow separating molten metal in said stretches of said siphon conduit; and

a gate in said intermediate crucible for selectively unblocking the end of said delivery conduit opening into said intermediate crucible and for the gas-tight sealing thereof.

4,153,101

NOZZLE FOR FEEDING LIQUID METAL TO A CONTINUOUS PLATE CASTING MACHINE

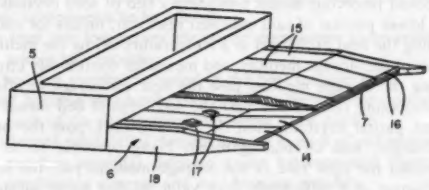
Jean-Marie Chateau, Seyssinet; Marc Tavernier, and Paul Descous, both of Coublevie, all of France, assignors to Societe de Conditionnements en Aluminium Scal, Paris, France

Filed Nov. 11, 1977, Ser. No. 850,474

Claims priority, application France, Jul. 27, 1977, 77 23845

Int. Cl.² B22D *11/06, 11/10*

U.S. Cl. 164—428 **8 Claims**



1. In a machine for the continuous casting of molten metal between a pair of cylindrical rolls mounted for rotational movement about horizontal axes, a nozzle for feeding the molten metal comprising an upper plate and a lower plate joined one to the other by cheeks having an orifice from which the molten metal issues, said cheeks extending forwardly beyond the orifice and the inner side walls of said cheeks defining in succession a straight portion parallel with the axis of the nozzle dimensioned to have a length between the thickness of the cast band and the depth of the liquid metal pool, the depth of the liquid metal pool defined as the distance of the liquid metal from the orifice to a position where the liquid metal has completely solidified, and a portion that diverges from the axis of the nozzle at an angle within the range of 5° to 15° and which extends to the plane between the axes of the cylindrical rolls.

4,153,102

ROTOR POST

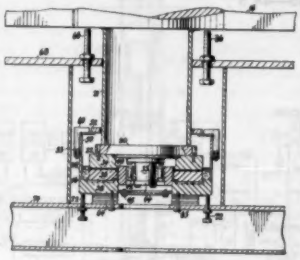
Richard F. Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,438

Int. Cl.² F28D *19/00*

U.S. Cl. 165—8 **7 Claims**

1. Rotary regenerative heat exchange apparatus including a cylindrical rotor housing having walls at opposite ends thereof that include spaced apertures for a heating fluid and for a fluid to be heated, a rotor of heat absorbent material disposed about a vertical rotor post within said housing adapted to receive the heating fluid and the fluid to be heated, a support bearing for the rotor mounted on fixed support structure subjacent said rotor, shim means intermediate the support bearing and the support structure therefor adapted to transmit the load of the rotor to said support structure, a first lifting means intermediate the support bearing and its support structure adapted to move the bearing axially relative to said shim means, and a



second lifting means for raising the rotor relative to said rotor housing to remove the load of the rotor from said support bearing whereby said first and second lifting means may be alternately actuated to vary the distance between the rotor and said support structure to permit removal of said shim means therebetween.

4,153,103

VACUUM TANK

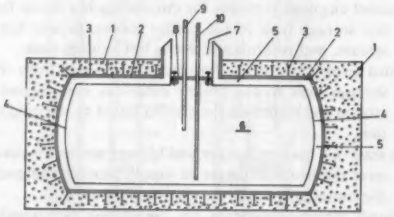
Emil Bächli, Hauptstrasse 156, 5340 Endingen, Aargau, Switzerland

Filed Oct. 25, 1977, Ser. No. 844,529

Claims priority, application Switzerland, Aug. 16, 1977, 010121/77

Int. Cl.² F24H *3/00*

U.S. Cl. 165—47 **7 Claims**



1. A vacuum tank, especially for the storage of heat over a long period of time, comprising:

an outer pressure shell;

an inner shell spaced from said outer pressure shell;

said outer pressure shell and said spaced inner shell forming therebetween a permanently evacuated intermediate space;

said pressure shell being formed of concrete:

a metal covering tightly bearing at the pressure shell;

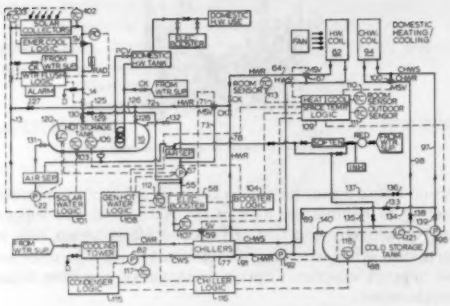
support means for the metal covering and anchored in the pressure shell; and

said inner shell being formed of a compression-resistant material.

4,153,104
SOLAR HEATING AND COOLING SYSTEM

Carl J. Ruder, Overland Park, Kans., assignor to Overland Energy, Inc., Shawnee Mission, Kans.

Filed Sep. 8, 1977, Ser. No. 831,515
Int. Cl.[2] F25B 29/00
U.S. Cl. 165—48 S 30 Claims



1. A solar-energized system for heating, cooling and supplying domestic hot water for a building space, comprising:

a hot liquid storage tank;

means for collecting solar energy as heat and transferring the heat to flowing liquid;

first liquid circulation means directing liquid from the hot storage tank through the solar energy collecting means and returning the heated liquid to the hot storage tank;

a cold liquid storage tank;

chiller means operable on heat from a hot liquid stream, for cooling a second liquid stream;

second circulation means for circulating hot liquid from the hot storage tank to the chiller means, as said hot liquid stream, and returning it to the hot storage tank;

third circulation means for circulating liquid from the cold storage tank to the chiller means as said second liquid stream and returning the chilled liquid to the cold storage tank;

at least one heat exchanger and blower means for passing air over the heat exchanger to supply heating and cooling to the building space;

fourth circulation means for circulating hot liquid when required from the hot storage tank to the heat exchanger and returning it to the hot storage tank;

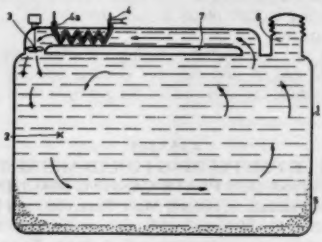
fifth circulation means for circulating chilled liquid when required from the cold storage tank to the heat exchanger and returning it to the cold storage tank; and

a domestic hot water system including a domestic hot water tank, a heat exchanger coil positioned within the hot liquid storage tank, conduits connecting the domestic hot water tank with each end of the coil, means for circulating water from the domestic tank through the coil when heating is required, means supplying source water when required to the conduit upstream of the coil, and a conduit near the upper end of the domestic tank for drawing off heated water for domestic use.

4,153,105
REVERSIBLE LATENT HEAT STORAGE METHOD, AND REVERSIBLE LATENT HEAT ACCUMULATOR

Johann Schroder, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 676,718, Apr. 14, 1976, Pat. No. 4,091,863. This application Mar. 20, 1978, Ser. No. 887,951
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1975, 2517921
Int. Cl.[2] F28D 1/04, 15/00; F24D 11/02; F28F 13/12
U.S. Cl. 165—104 S 10 Claims

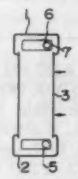


1. Apparatus for utilizing latent heat stored in a crystallizable liquid heat storage medium subject to super-cooling, which comprises an enclosed reservoir containing a body of said storage medium, a heat exchanger associated with said enclosed reservoir, means providing a bed of seed crystals in the lower portion of said enclosed reservoir, means for maintaining the heat exchanger at a temperature below the melting point of the storage medium, and means for continously circulating the storage medium past the heat exchanger to effect supercooling thereof and past the seed crystal bed means to effect partial crystallization thereof and back past the heat exchanger, said circulating means being operable so as to maintain the flow rate of the storage medium past the heat exchanger at a sufficiently high value so that no or substantially no crystallization of the storage medium occurs near the heat exchanger and no or substantially no crystals are formed on the heat exchanger.

4,153,106
PARALLEL FLOW TYPE EVAPORATOR

Noriaki Sonoda, and Kiyoshi Koike, both of Tokyo, Japan, assignors to Nihon Radiator Co., Ltd. (Nihon Rajieeta Kabushiki Kaisha), Tokyo, Japan

Filed Mar. 1, 1977, Ser. No. 773,237
Claims priority, application Japan, Mar. 9, 1976, 51-27005[U]; May 11, 1976, 51-58392[U]
Int. Cl.[2] F28F 9/22
U.S. Cl. 165—174 3 Claims



1. A parallel flow type evaporator comprising a first and a second tank, a plurality of flat pipes communicating between said first and second tanks, fins inserted between adjacent flat pipes, an outlet pipe inserted into the innermost regions of said first tank and an inlet pipe communicating with said second tank, said outlet pipe and said inlet pipe inserted near the wind-

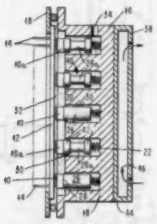
ward region of said first and second tanks, and said outlet pipe provided with a plurality of bores adjacent said flat pipes communicating between said first and said second tanks.

4,153,107

TEMPERATURE EQUALIZING ELEMENT FOR A CONDUCTION COOLING MODULE

Vincent W. Antonetti, and Omkarath R. Gupta, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,740
Int. Cl.[2] F28F *7/00*
U.S. Cl. 165—185 **6 Claims**



1. In a conduction cooling module of the type having a conduction heat transfer path for removing heat from electronic components to be cooled,

at least one low-power electronic component to be cooled within said module;

a housing member included in the heat transfer path;

said housing member having openings therein, one opposite each of the electronic components to be cooled;

a thermal conduction element located in each of said housing member openings defining a gap between said thermal conduction element and said housing member;

a predetermined diminished diameter portion of a predetermined length extending intermediate full diameter end portions of said thermal conduction elements located in said housing member opening located opposite said low-power electronic components thereby increasing the gap between said thermal conduction elements and said housing member which increases the thermal resistance of the path for the low-power electronic components; and

resilient means urging said thermal conduction elements against the electronic components to be cooled to form a heat transfer interface therebetween.

4,153,108

WELL TOOL

Steve R. Pounds, Pearsall; Carter R. Young, Lewisville, both of Tex., and Richard J. Trahan, Gretna, La., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 12, 1977, Ser. No. 859,678
Int. Cl.[2] E21B *23/02, 23/04, 33/124*
U.S. Cl. 166—118 **6 Claims**

1. A well tool comprising,

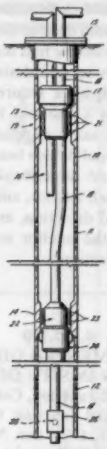
a mandrel,

means on the mandrel engageable with a casing to prevent downward movement of the mandrel,

latch means movable axially upwardly along the mandrel and engageable with a no-go shoulder within a casing to prevent upward movement of the mandrel,

means for expanding and moving said latch means axially upwardly along the mandrel from a first lower retracted position to a second upper expanded position in engagement with said shoulder,

releasable means preventing movement of the latch means from said second position to said first position,



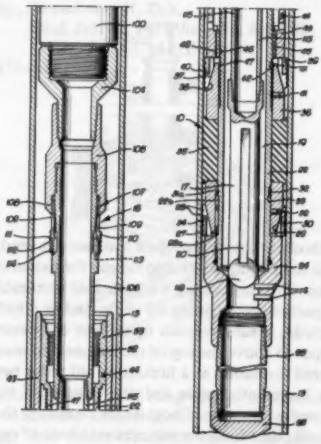
and means rendering said releasable means ineffective and permitting said latch means to move from said second to said first position.

4,153,109

METHOD AND APPARATUS FOR ANCHORING WHIPSTOCKS IN WELL BORES

Andrew J. Szescila, Broussard, La., assignor to Baker International Corporation, Los Angeles, Calif.

Filed May 19, 1977, Ser. No. 792,251
Int. Cl.[2] E21B *7/08, 23/00, 47/024*
U.S. Cl. 166—250 **20 Claims**



16. Apparatus for securing a whipstock in a well bore, comprising an anchor, means for securing said anchor in the well bore, a whipstock, anchor means secured to said whipstock and having coupling means thereon engageable with said anchor to secure said anchor means to said anchor and permanently prevent upward movement of said whipstock in the well bore, said anchor having an upper threaded member, said coupling means comprising a threaded latch movable downwardly along said upper threaded member and into latching engagement with said upper threaded member.

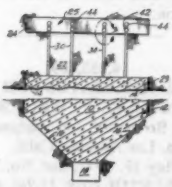
17. A method of securing a whipstock in a well bore with the whipstock facing in a desired direction, comprising lowering an anchor having a first directional device into the bore hole to a desired setting depth and determining the angular relation between said device and said desired direction, then setting the anchor in the well bore with the first directional device having the same angular relation to said desired direction, lowering into the well bore a whipstock secured to an anchor means operatively connected to a mandrel having a second directional device having the same angular relation to the whipstock as said first directional device bears to said desired direction, engaging said second directional device with said first device to turn the mandrel, anchor, and whipstock to face the whipstock in said desired direction, and coupling the anchor means with respect to the anchor to retain the whipstock facing in said desired direction.

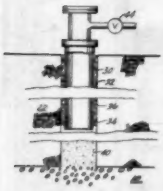
4,153,110

IGNITION OF FRAGMENTED OIL SHALE BELOW A SILL PILLAR IN AN IN SITU OIL SHALE RETORT

Richard D. Ridley, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jun. 13, 1977, Ser. No. 805,692
Int. Cl.[2] E21B *43/24, 43/26*
U.S. Cl. 166—262 **25 Claims**





1. A method of recovering liquid and gaseous products from an in situ oil shale retort in a subterranean formation containing oil shale, the retort containing a fragmented permeable mass of formation particles containing oil shale, and in which the formation includes a subterranean open base of operation at an elevation spaced above the top of the fragmented mass, leaving unfragmented formation as a horizontal sill pillar between the top of the fragmented mass and the bottom of the base of operation, and a plurality of bore holes extending through the horizontal sill pillar from the subterranean base of operation to the fragmented mass, the method including the steps of:

placing a permeable mass of combustible material in at least one of such bore holes;

igniting the combustible material in such a bore hole;

introducing oxygen supplying gas through the ignited permeable mass of combustible material in such a bore hole to generate heated ignition gas in such bore hole; and

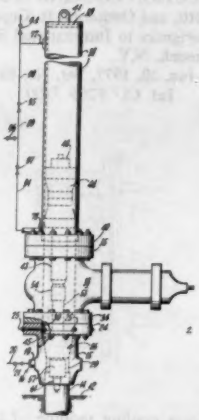
introducing the heated ignition gas from such bore hole to the fragmented mass of particles containing oil shale to ignite the fragmented mass and establish a combustion zone therein.

4,153,111

WELL HEAD RETRIEVER TOOL AND METHOD

Kenneth I. T. Lans, and Desmond E. Ross, both of Pointe-a-Pierre, Trinidad and Tobago, assignors to Texaco Trinidad, Inc., Pointe-a-Pierre, Trinidad and Tobago

Filed Sep. 23, 1977, Ser. No. 835,928
Int. Cl.[2] E21B *33/03*
U.S. Cl. 166—315 **10 Claims**



1. A retriever for use on a well having casing pressure and including a well head with valve means mounted thereon to contain said casing pressure, comprising in combination

a mandrel having a piston adjacent to one end for supporting the weight thereof and having a plug for said well head at the other end,

said mandrel being long enough to extend through said valve means when said plug is in place at said well head,

a pressure tight housing comprising a cylinder adapted for cooperating with said piston and having an exit and adapted for receiving said mandrel therein with said plug facing said exit,

said housing also having means for attaching said exit to said valve means on the side opposite to said well head,

means associated with said housing for cooperating with said mandrel supporting means and for releasing said mandrel when said valve means is open whereby said plug will fall into place at said well head, and

means for securing said plug against said casing pressure whereby said valve means may be removed without killing said well.

8. Method of removing a shooting valve or blow-out preventer or the like from a well head after the well has developed pressure, said well head having a casing fixture with a lateral port therein connecting the interior of said casing with the exterior of said fixture, comprising the steps of

assembling a mandrel having a piston at one end and a tubing hanger at the other end with a plug in said hanger,

said mandrel being long enough to extend through said shooting valve when said tubing hanger is seated in said casing fixture,

inserting said mandrel piston end first into a cylindrical member having a closed end and a flange at the other end adapted for being coupled to said shooting valve,

coupling said cylindrical member onto said shooting valve with said mandrel inside,

applying pressure beneath said piston in said cylindrical member to lift said mandrel up enough to clear said shooting valve,

opening said shooting valve,

equalizing the pressure on both sides of said piston in order to allow said mandrel to fall until said hanger seats in said casing fixture,

fixing said hanger and plug in place in said casing fixture to contain said well pressure,

releasing said equalization pressure and said pressure beneath said piston, and

uncoupling and removing said shooting valve and cylindrical member together.

4,153,112

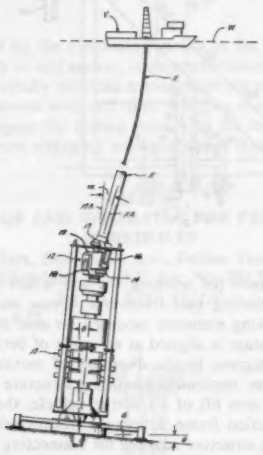
FLEX JOINT

Robert R. Luke, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Jul. 1, 1977, Ser. No. 812,049

Int. Cl.[2] E21B *33/035*

U.S. Cl. 166—355 **10 Claims**



1. A flex joint for connecting elongate members, comprising a first end connectible in axial alignment with a first of said members, a second end connectible in axial alignment with the second member, means connecting the first and second ends for flexing about the intersection of their longitudinal axes, said first and second ends having tubular portions which carry means thereon for sealably engaging one another during flexing of the joint, and means connected to the connecting means and each of said first and second ends for use in sensing and producing signals representing the angle between and relative direction of said axes, each of said first and second ends also having a pair of arms, said connecting means including a gimbal ring externally disposed about the tubular portions and a pair of pins connecting each pair of arms to the gimbal ring for pivoting about axes perpendicular to one another, and said means for use in sensing and producing said signals comprises a first part fixed to a pin of each pair of pins, a second part fixed to an arm of each pair of arms, and means connected to said parts for use in sensing the direction and extent of relative rotation therebetween about the pivotal axis of the pin.

4,153,113

SUBSEA DRILL-THRU MANIFOLD CENTER

John W. Hopkins, Sunnyvale, Calif., and Claude A. Sellars, Houston, Tex., assignors to Lockheed Petroleum Services, Ltd., New Westminster, Canada

Filed Dec. 2, 1977, Ser. No. 856,784

Int. Cl.[2] E21B *7/12*

U.S. Cl. 166—356 **3 Claims**

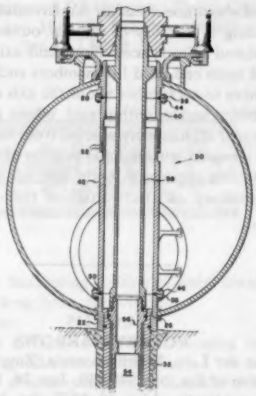
1. A subsea drill-thru manifold center for petroleum well completion and production comprising:

a drill-thru manifold center divided into a plurality of compartments by gas tight bulkheads;

a top spool welded to the top of at least one of said plurality of compartments;

a bottom spool welded to the bottom of at least one of said plurality of compartments coaxially with said top spool;

a removable sleeve mounted between said top spool and said bottom spool;



said top spool, bottom spool and removable sleeve defining a conduit for the drilling and completion of a petroleum well while allowing said compartment to remain dry, and

wherein said manifold center is further defined as including at least two well cylindrical structures divided into a plurality of compartments and at least two production cylinders interconnecting said well cylindrical structures.

4,153,114

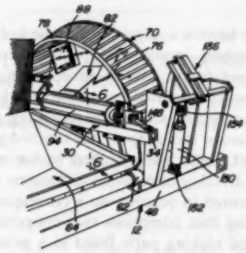
ROCK PICKER WITH KICKER ROLLER

Reuben D. Morlock, Jamestown, N. Dak., assignor to Haybuster Mfg. Inc., Jamestown, N. Dak.

Filed Jul. 26, 1977, Ser. No. 819,135

Int. Cl.[2] A01B *43/00*

U.S. Cl. 171—65 **18 Claims**



1. A stone gatherer including frame structure, a hollow generally truncated cone-shaped wheel having closed and open major and minor diameter ends, respectively, means journalling said wheel from said frame structure for rolling along the ground surface over which said frame structure is advanced with the axis of rotation of said wheel lying in a substantially vertical plane generally normal to the direction of intended movement of said frame structure and inclined relative to the horizontal an amount substantially equal to the angle of displacement of the slant height of said wheel relative to the wheel center axis with the lowermost slant height of the wheel generally horizontally disposed, means supported from said frame structure for engagement with and laterally deflecting stones lying upon the ground over which said frame struc-

ture is advanced into the open end of said wheel, said wheel including circumferentially spaced lift members spaced about the interior thereof for engaging and elevating the rocks deflected into said open end upon rotation of said wheel, said wheel including a body occupying the central portion of the interior thereof, thereby limiting the useful volume to an outer circumferential area of the interior thereof, said lift members being spaced about said outer circumferential area thereof, said body including a plurality of radially outwardly facing relatively angulated sides spaced about said axis and convergent toward said open end, said lift members and body sides being spaced relative to each other about the axis of rotation of said wheel whereby stones within said wheel and engaged and elevated by said lift members will fall from the latter by gravity upon being elevated into an upper portion of said wheel, downwardly onto the uppermost body side for movement downwardly therealong and outwardly of the open side of said wheel.

4,153,115

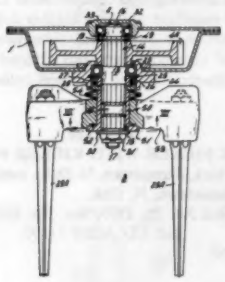
ROTARY HARROWS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 590,580, Jun. 26, 1975, abandoned. This application Mar. 10, 1977, Ser. No. 776,356

Int. Cl.[2] A01B *9/00*

U.S. Cl. 172—59 **5 Claims**



2. A rotary harrow comprising a frame and a plurality of soil working members mounted on a transverse hollow frame portion of said frame, said members being positioned in a transverse row and rotatably mounted on substantially vertical shafts, at least one of said shafts mounting an upper toothed pinion and a lower tool support, the toothed pinions of immediately adjacent shafts being housed within said hollow frame portion and drivably interconnected to one another, said pinion being secured in position on a corresponding shaft by an encircling ring that comprises two cooperating and substantially identical locking parts fitted in a groove that encircles said shaft, said parts extending beyond the groove and bearing on the upperside of said pinion, said ring parts being surrounded by a cylindrical spacing sleeve member that also surrounds said shaft, upper and lower sides of said sleeve member abutting an upper bearing on said shaft and said toothed pinion, respectively, the lower side said pinion abutting a lower bearing on the shaft and housing means on said frame portion holding the lower bearing in position against vertical movement relative to the frame portion and overload means releasably clamping said support between said lower bearing and fastening means on the lower end of said one shaft, sleeve means slidably positioned on said shaft between the lower surface of said lower bearing and said fastening means for preventing vertical movement of said shaft relative to said lower bearing.

4,153,116

IMPLEMENT WITH ANGLED BEAM AND MOUNTING STRUCTURE FOR CONNECTION TO A THREE ARM LIFT

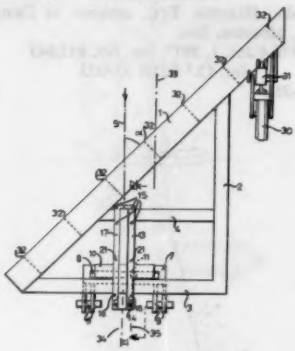
Willem J. P. van Tonder, Erfdeel, South Africa

Filed May 18, 1977, Ser. No. 797,987

Claims priority, application South Africa, May 26, 1976, 76/3173; Sep. 24, 1976, 76/5730; Mar. 18, 1977, 77/1636

Int. Cl.[2] A01B *59/06, 59/043*

U.S. Cl. 172—446 **5 Claims**



1. An implement for working the soil which comprises a main frame including two transverse beams and an angled beam, soil working elements mounted on said angled beam, which angled beam is aligned at an angle of between 35 degrees and 70 degrees to the direction of movement of the implement in use, implement mounting structure for connection to a three arm lift of a tractive vehicle, the implement including a traction frame defining a transversely extending slot, connecting structure adapted for connecting the traction frame to two lower arms of the three arm lift of the tractive vehicle, an upright pin which can pass through the slot in any transverse position of the slot, structure adapted to connect the pin to a transverse beam of the main frame in any transverse position of this beam, a tower beam, structure adapted for connecting the tower beam to the two transverse beams of the main frame in any transverse position of these beams, and structure adapted for connection between a third upper arm of the three arm lift and the tower beam which comprises a channel at its forward end through which is passed a horizontal pin for connection with the third upper arm of the three arm lift, the horizontal pin being fixed to a beam part which is adapted to be connected to the foremost of the two transverse beams lying parallel to and behind the said transverse beam.

4,153,117

CUSHION DOZER WITH THREE POINT ATTACHMENT SUPPORT

Gary P. Freese, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

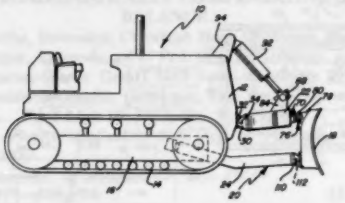
Filed Sep. 29, 1977, Ser. No. 837,966

Int. Cl.[2] E02F *3/76*

U.S. Cl. 172—809 **3 Claims**

1. In a cushion bulldozer blade mounting assembly for attachment of a blade to a tractor, said mounting assembly having a lower frame and an upper frame, said lower frame having a pair of push arms with each arm being pivotally mounted to a track roller frame on the tractor and to one lower corner of said blade, means interconnecting said push arms to permit limited relative motion between said push arms, said upper frame has a C-shape with the legs of the "C" being pivotally connected to the tractor frame at spaced apart points, a trunnion pivotally mounted to the upper midportion of the blade and projecting rearward therefrom, a socket in said upper

frame for slidably and rotatably receiving said trunnion whereby said blade is permitted to move longitudinally and rotatably relative to said upper frame, a pair of cushioning means are seated in said upper frame, said cushioning means are equally spaced on opposite sides of said trunnion and are connected to said blade whereby shock loads on the blade will



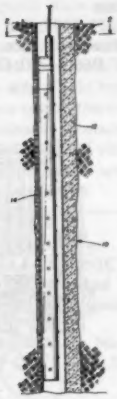
be cushioned by the cushioning means as the trunnion slides longitudinally in said socket, stops are mounted on said upper frame and pivotally mounted mating stops are mounted on said blade in alignment with said stops whereby shock loads on the blade will engage the mating stops with the stops, and means on said trunnion engaging with said upper frame.

4,153,118

METHOD OF AND APPARATUS FOR PERFORATING BOREHOLES

Michael L. Hart, 2906 Maple Ave., Dallas, Tex. 75201

Filed Mar. 28, 1977, Ser. No. 781,991
Int. Cl.[2] E21B *43/116*
U.S. Cl. 175—4.51 **4 Claims**



1. A method of perforating non-vertically oriented boreholes comprising:

suspending a well perforator apparatus from a point substantially laterally displaced from an axis extending through the center of gravity of the well perforator apparatus;

lowering the thus suspended perforator apparatus into the borehole to be perforated so that the center of gravity of the well perforator apparatus is aligned with the low side of the borehole under the action of gravity;

actuating the thus positioned well perforating apparatus to discharge a perforating charge in a predetermined direction with respect to the alignment of the center of gravity of the well perforating apparatus with the low side of the borehole;

the well perforator apparatus having a central axis;

the center of gravity of the well perforator apparatus being located on an axis substantially laterally displaced from the central axis; and

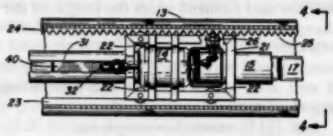
the suspending step being carried out by suspending the well perforator apparatus from a point substantially aligned with the central axis.

4,153,119

DIRECTIONAL DRILLING APPARATUS

Tibor O. Edmond, Ponca City, Okla.; Rondon L. Schroeder, Wichita, Kans., and Clarence C. Smith, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Apr. 10, 1978, Ser. No. 894,865
Int. Cl.[2] E21B *3/06*
U.S. Cl. 175—27 **3 Claims**



1. Apparatus for facilitating drilling of small diameter holes radially of a mine long hole comprising:

a housing member;

a guide channel member within said housing including a straight section and a curved section;

a sleeve device at least partially contained by said guide channel member and adapted to move longitudinally within said guide channel member, said sleeve device being formed of a plurality of sleeve segments in end-to-end relationship, said sleeve segments having longitudinal passages therethrough and being interconnected by connecting means permitting said sleeve device to move through said curved section of said guide channel member and restricting relative movement of any sleeve segments extending beyond the guide channel member whereby sleeve segments extending beyond the guide channel member define a straight path therefrom;

a flexible drill shaft extending through said longitudinal passages through said sleeve segments, said shaft being connected at one end to a drill bit; and

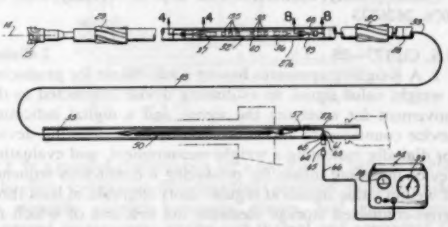
motor means connected to the other end of said shaft for providing rotation thereto, said motor means also being adapted to move said drill shaft forwardly through said guide channel member.

4,153,120

CHANGE IN LENGTH OF DRILL STRING WHILE INSTRUMENT REMAINS THEREIN

Bernard R. Zuvela, and Raymond W. Teys, both of Fountain Valley, Calif., assignors to Scientific Drilling Controls, Newport Beach, Calif.

Filed Oct. 3, 1977, Ser. No. 838,653
Int. Cl.[2] E21B *7/00*
U.S. Cl. 175—57 **25 Claims**



1. The method that comprises:

drilling a hole into the earth utilizing a tubular drill string which is formed of interconnected pipe sections and which contains an instrument, a flexible line extending

from the instrument through the drill string to a unit at the surface of the earth, and an element within an outer portion of the drill string about which a portion of said flexible line is wound;

changing the length of the drill string by changing the number of pipe sections therein;

leaving in the drill string during such change in length said instrument and a part of said flexible line leading from the instrument toward the surface of the earth;

breaking the connection from said part of the flexible line to said unit while the length of the drill string is being changed;

changing the number of turns of said flexible line which are wound on said element when the length of the drill string is changed to correspondingly alter the effective length of the flexible line; and

reconnecting said part of the flexible line in the drill string to said unit after the length of the drill string has been changed.

4,153,121

FLUID OPERATED UNDERCUTTER

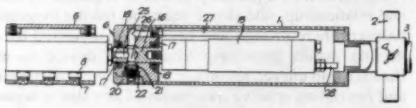
David T. Allan, Glasgow, Scotland, assignor to John MacDonald & Company (Pneumatic Tools) Ltd., Great Britian

Filed Dec. 13, 1976, Ser. No. 749,611

Claims priority, application United Kingdom, Dec. 29, 1975, 53060/75

Int. Cl.[2] **E25B** *9/00*

U.S. Cl. 175—96 **3 Claims**



1. An undercutter comprising a substantially tubular body adapted to be received within a parallel-sided hole; a rotary percussion head at one end of the body and having one or more cutting tools radially extending from, obtusely angled to, and adapted to cut outwardly from the axis of said body; means for rotating said head about the axis of said body; and means for operating said percussion head at any predetermined depth in said hole so that the cutting tools act on the wall thereof, said percussion head being cylindrical and is provided with a plurality of cutting tools which are disposed in rows spaced axially with respect to said body.

4,153,122

WEIGHING APPARATUS

Mathijs M. J. Engels, Koudekerk aan den Rijn, and Albert H. Devoogd, Limburg, both of Netherlands, assignors to Maatschappij Van Berkel's Patent N.V., Rotterdam, Netherlands

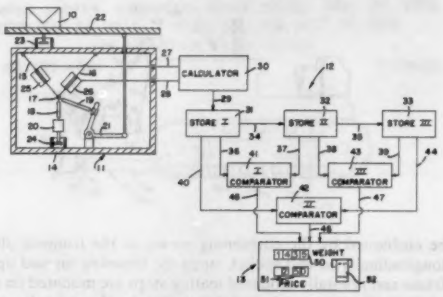
Filed Jun. 6, 1977, Ser. No. 803,894

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1076, 2626023

Int. Cl.[2] **G01G** *19/417, 23/36*

U.S. Cl. 177—25 **2 Claims**

1. A weighing apparatus having a movement for producing a weight value signal, an evaluating device connected to the movement for receiving the signal, and a digital indicating device connected to and controlled by the evaluating device for digitally indicating a weight measurement, said evaluating device including means for producing a continuous sequence of weight value signals at regular short intervals, at least three series-connected storage elements the first one of which receives the latest weight value signal and the others of which receive in consecutive order the next previous weight value signal, and a plurality of comparators of equal number to the number of storage elements each of which include a pair of inputs connected to a different pair of said storage elements and an output connected to said indicating device, each said comparator transmitting the content of the storage elements connected thereto to the indicating device only if the weight value signals from said storage elements are identical, whereby said evaluating device will prevent transmission to the indicating device any group of consecutive weight value signals which differ from the weight measurement in the indicating device so long as the group is numerically smaller than a predetermined minimum number required to change the weight measurement.



4,153,123

HOISTING AND HANDLING DEVICE HAVING WEIGHING MEANS

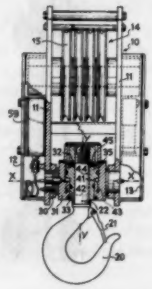
Daniel Bereyziat, Suresnes, France, assignor to Etablissements DEBOR, Paris, France

Filed Jun. 29, 1977, Ser. No. 811,275

Claims priority, application France, Feb. 2, 1977, 77 02895

Int. Cl.[2] **B66C** *1/40;* **G01G** *5/04*

U.S. Cl. 177—147 **7 Claims**



1. A hoisting and handling device comprising a support frame, an intermediate unit mounted in the support frame to rotate about a first axis, a load hooking means carried by the intermediate unit, said intermediate unit having an element defining a cylinder, a cover fixed at the upper part of said element and a stepped piston mounted in the cylinder and defining therewith a sealed annular chamber, an incompressible fluid filling the chamber and means for measuring pressure connected to the chamber, said pressure representing the load carried by the hooking means, said hooking means having a stem extending through the intermediate unit and mounted to rotate therein about a second axis perpendicular to said first axis, a member supported at the upper end of the stem and a rolling thrust bearing interposed between the piston and said member, said cover enclosing said member and said thrust bearing, abutment means being provided on the intermediate unit and cooperating with the upper face of the piston for limiting the upward movement of the piston in the cylinder,

with interposition of an elastically yieldable shock-absorbing means between said abutment means and the upper face of the piston.

4,153,124
ELECTROMAGNETICALLY COMPENSATING BEAM BALANCE

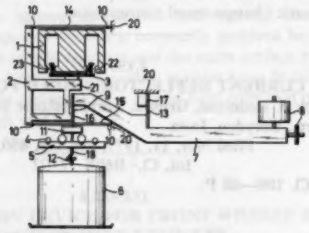
Erich Knothe, Bovenden; Christoph Berg, Göttingen, and Franz J. Melcher, Ellierode, all of Fed. Rep. of Germany, assignors to Sartorius-Werke GmbH (und vorm. Göttinger Präzisionswaagenfabrik GmbH), Göttingen, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,636

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621483

Int. Cl.[2] G01G 7/02, 21/24

U.S. Cl. 177—210 EM **14 Claims**



1. In an electromagnetically compensating beam balance having a balance housing, a beam, fixed counterweight means on the beam, electromagnetic force compensation means for fine compensation and a weight changing means on its load-receiving side for coarse compensation, the improvement comprising at least two rods connected to said housing; a load carrier connected on one side of said beam with said rods and forming a parallel guidance system therewith, said rods accepting substantially only primarily horizontal forces and being coupled to said balance housing, and vertical flexure elements connected to said housing and which accept primarily vertical forces and are coupled to said beam.

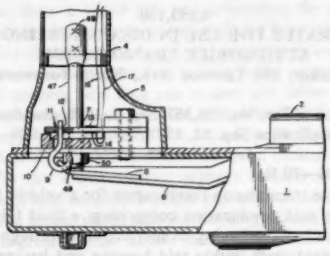
4,153,125
DIGITAL ELECTRONIC SCALE

William Y. Hutchinson, Chicago, and Walter P. Kushmuk, Niles, both of Ill., assignors to Continental Scale Corporation, Bridgeview, Ill.

Filed May 5, 1977, Ser. No. 794,058

Int. Cl.[2] G01G 3/14, 21/02

U.S. Cl. 177—211 **8 Claims**



1. A platform type weighing scale comprising:

(a) a horizontally disposed base having a vertically movable weighing platform mounted thereon, said base having an extension beyond said weighing platform,

(b) a vertically disposed column mounted on said extension of said base of (a), said column having a hollow base portion,

(c) weighing mechanism mounted on said base operatively associated with said platform of (a), said weighing mechanism including a lever which moves in response to actuation of said weighing mechanism by a load placed on said platform of (a), said lever extending from said weighing mechanism to an area below said column,

(d) a load beam mounted on said extension of said base of (a) in said hollow base portion of said column of (b),

(e) connecting means connecting said lever of (c) with said load beam of (d) so as to transmit a load from said lever of (c) to said load beam of (d) to produce a movement of said load beam of a fraction of an inch,

(f) one or more electrical strain gauges mounted on said load beam,

(g) a digital voltmeter,

(h) means connecting the electrical output from said strain gauge of (f) to said digital voltmeter of (g), and

(i) a read-out meter operatively associated with said digital voltmeter of (g) to show measurements in units of weight(.), said connecting means of (e) extending upwardly through a hole in said load beam of (d), said hole having conical sides and said connecting means of (e) containing a semi-spherical member to seat in said conical sides of said hole and engaging the sides of said hole whereby said load beam of (d) is pulled downwardly when a load is applied to said platform of (a) causing downward movement of said lever of (c).

4,153,126
PARALLEL CONSTRUCTION FOR A TOP-LOADING BALANCE

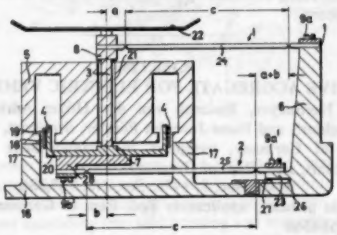
Erich Knothe, Bovenden; Christoph Berg, Gottingen; Eberhard Stadler, Göttingen, and Hans-Heinrich Köhne, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrick GmbH), Gottingen, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,590

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710788

Int. Cl.[2] G01G 21/24, 7/02

U.S. Cl. 177—229 **13 Claims**



1. In a parallel construction for a top-loading balance having a housing, comprising two essentially identical movable guides in mutually parallel horizontal planes, said guides being mounted permanently at one end thereof and connected together by a movable rigid connecting element at the other end thereof, the improvement wherein said guides are displaced relative to one another in their planes at right angles to their axis of rotation.

4,153,127

STRUCTURAL UNIT FOR AN ELECTRIC VEHICLE

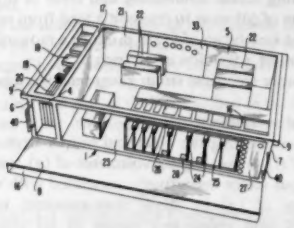
Rainer Klink, Stetten-Rommelshausen, and Günther König, Bittenfeld, both of Fed. Rep. of Germany, assignors to Firma Deutsche Automobilgesellschaft mbH, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,765

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1975, 2538744

Int. Cl.[2] B60L *15/00*

U.S. Cl. 180—65 R **17 Claims**



1. In an assembly for a vehicle having electrically powered control means and a battery, the improvement comprising: a rack; rubber cushions for flexibly mounting said rack on said vehicle; guide means on said rack; a module; guide means on said module for engaging said rack guide means to enable said module to be removeably inserted in said rack; components on said module for regulating said control means; a plurality of first electrically conducting socket means on one of said rack and said module; a plurality of first electrically conducting complementary plug-in contact means on the other of said rack and said module for engaging said first socket means; second electrically conducting socket means on one of said rack and said module; and second electrically conducting complementary plug-in contact means on the other of said rack and said module for engaging said second socket means, the first and second electrically conducting means on said module being connected to said components, the first electrically conducting means on said rack being connected to said control means, and the second electrically conducting means on said rack being connected to said battery, said second electrically conducting complementary plug-in contact means being of a robust construction, said first electrically conducting complementary plug-in contact means being weakly constructed in comparison to said first electrically conducting complementary plug-in contact means and said second electrically conducting plug-in contact means providing additional guidance for insertion of said module by exactly centering said first electrically conducting complementary plug-in contact means relative to said first electrically conducting socket means prior to their plug-in engagement.

4,153,128

DRIVE AGGREGATE FOR ELECTRIC VEHICLES

Ulrich Heitmeyer, Rosbach von der Höhe; Adrian Kupsa, Düsseldorf, and Hans-Joachim Förster, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

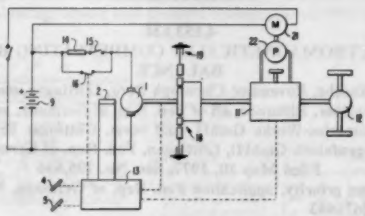
Filed Dec. 3, 1976, Ser. No. 747,336

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1975, 2554548

Int. Cl.[2] B60K *1/00*

U.S. Cl. 180—65 E **14 Claims**

1. In a drive aggregate for electric vehicles of the type comprising an electric shunt motor with a field winding and field current control for adjusting the motor speed by field regulation. and a change-speed transmission having plural stepped speed ratios, said change-speed transmission being connected with the shunt motor, the improvement in that the shunt motor has a relatively high rated rotational speed in relation to its maximum rotational speed and a relatively reduced field-weakening range, wherein a speed reduction transmission is provided, said speed reduction transmission interconnecting said shunt motor with said change-speed transmission, and wherein said change-speed transmission is a hydraulic automatic change-speed transmission.



4,153,129

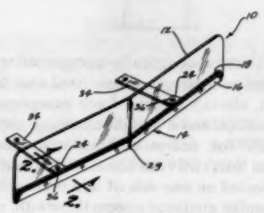
AIR CURRENT DEFLECTOR SHIELD FOR VEHICLES

Patrick J. Redmond, Grimes, Iowa, assignor to Deflecta-Shield Corp., Corydon, Iowa

Filed Nov. 11, 1977, Ser. No. 850,732

Int. Cl.[2] B60K *11/02*

U.S. Cl. 180—68 P **4 Claims**



1. An air current deflector shield, comprising,

a shield member comprised of a single piece of unbroken transparent material having a lower edge,

an elongated rigid bracket curved at its midpoint, said bracket having a forward wall and rearward wall defining a channel therebetween,

said channel being adapted to receive said lower edge of said shield member, and

an adhesive material interposed between said lower edge of said shield member and said channel of said bracket to securely bind said shield member to said bracket in the curved shape defined by said bracket.

4,153,130

APPARATUS FOR USE IN DISASSEMBLING AN AUTOMOBILE TRANSMISSION

Ronald Hacker, 390 Linwood Ave., North Tonawanda, N.Y. 14120

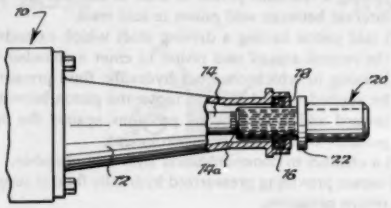
Continuation of Ser. No. 719,357, Sep. 1, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,800

Int. Cl.[2] B60K *17/22*

U.S. Cl. 180—70 R **6 Claims**

1. A drive transmission combination for a vehicle having a drive shaft, said combination comprising: a fluid filled drive transmission housing having an aperture therethrough; a transmission output shaft within said housing and having an end extending through said aperture; means on said output shaft end adapted to drivingly connect said output shaft with said drive shaft when said drive shaft is extended through said aperture; and a readily removable closure device sealing said housing against loss of said fluid throgh said aperture when said drive shaft is removed from said aperture, said closure

device comprising: a body shaped so as to be easily held in a user's hand, said body including two tubular portions, each having a predetermined axial length greater than the extension of said drive shaft within said aperture. each of said portions being open at one end and closed at the other end, at least one



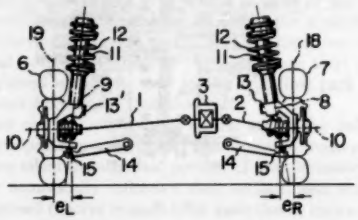
of said portions having an internal and external diameter whereby the open end thereof is co-axially received between the inner surface of said aperture and the outer surface of said output shaft in a generally concentric manner so as to substantially preclude the potential flow of said fluid over said output shaft and through said aperture.

4,153,131

SUSPENSION DEVICE FOR FRONT WHEELS IN AUTOMOTIVE VEHICLES

Mamoru Sakata; Hiroshi Yoshioka, and Masahiro Ohashi, all of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Daisha, Tokyo, Japan

Filed Aug. 5, 1976, Ser. No. 711,796
Claims priority, application Japan, Aug. 12, 1975, 50-97896
Int. Cl.² B60K *17/30*
U.S. Cl. 180—43 R **9 Claims**



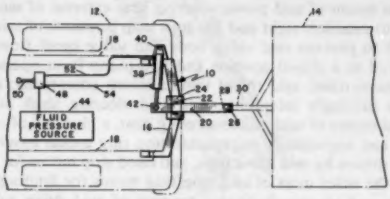
1. A suspension device for front wheels in automotive vehicles which comprises in combination: front wheels at both left and right sides of the vehicle body each of said wheels being rotatable about a wheel axle and contacting the ground surface; king pin means for suspension of said front wheels at said both sides of the vehicle body, said king pin means defining a king pin axis at each side of the vehicle body; means for receiving and holding said king pin means; and drive shafts connected at one end thereof to said front wheels and at the other end thereof to an engine output, said drive shafts being different in their shaft length and their angles of inclination, characterized in that a center offset quantity (measured along each said wheel axle between a center line of each said wheel perpendicular to said wheel axle and the king pin axis for each said wheel) is greater at the side of the long drive shaft than at the side of the short drive shaft when the camber of said left and right wheels is the same, said center offset quantities being chosen to compensate unbalanced rotatory moment exerted during vehicle acceleration upon the king pin axis at both left and right sides, said unbalanced rotatory moment being caused by the difference in the angles of inclination of said drive shafts.

4,153,132

TRAILER STEERING AND TOWING HITCH

Lawrence W. Biedebach, 2225 Primrose St., Vista, Calif. 92083

Filed Aug. 18, 1977, Ser. No. 825,573
Int. Cl.² B62D *5/06*
U.S. Cl. 180—136 **2 Claims**



1. A trailer towing and steering hitch system adapted for use in combination with passenger vehicles having a frame and a passenger compartment comprising,

a support frame adapted to be secured to the side rails of the frame of the vehicle and extend outward beneath the bumper at the rear of the vehicle,

a hitch connector member for pivotally and detachably connecting a trailer to said vehicle;

a lever pivotally mounted on said support frame and mounting said hitch connector member for movement transverse to the longitudinal axis of said vehicle, and

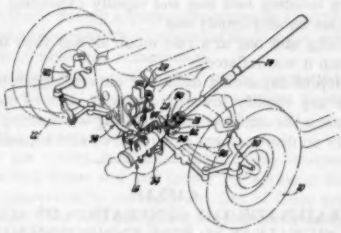
power means including a hydraulic motor mounted on said support frame and connected to said lever including control means positioned in the operator compartment for manipulation by an operator of said vehicle for selectively moving said lever member transverse to the longitudinal axis of said towing vehicle for selectively steering the trailer.

4,153,133

STEERING TRAVEL LIMITER FOR POWER STEERING GEAR

Stanley E. Anderson, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1977, Ser. No. 854,710
Int. Cl.² G62D *5/06*
U.S. Cl. 180—154 **4 Claims**



1. A power steering system for a vehicle having dirigible wheels comprising a manually rotatable steering shaft, a power steering gear, a housing for said power steering gear, rotatable input means extending into said housing and movable in clockwise or counterclockwise directions for right and left turn steering, output means extending from said housing, linkage means drivingly connecting said output means to the dirigible wheels of the vehicle, a power steering pump having pressure relief valve means therein for supplying pressure fluid for said system, hydraulically operated piston means mounted in said housing and operatively connected to said output means for the hydraulic drive of said output means, hydraulic control valve means disposed within said housing hydraulically connected to said pump and said piston means, said valve means

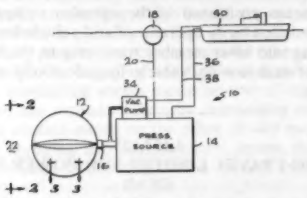
comprising valve spool means operatively connected to said input means and a valve body operatively connected to said connector means, said valve spool means being rotatably positioned relative to said valve body in response to manual rotation of said input means to partially close said valve means and condition said piston means for power assist drive of said output, and travel limiter means operatively connected to said input means of said power steering gear external of said housing to establish right and left turn stop positions of said input shaft to prevent said valve body and valve spool from being moved to a closed position and said pump from operating in pressure relief, said travel limiter means comprising: a drive tube drivingly interconnecting said steering shaft and said input means of said power steering gear, a plurality of concentric and sequentially engageable stop ring means mounted on and driven by said drive tube, and fixed stop means for engaging the outer most of said stop ring means for limiting clockwise and counterclockwise rotation of said drive tube and thereby corresponding rotation of said steering shaft and input means of said power steering gear.

4,153,134

UNDERWATER SEISMIC SOURCE

Lien C. Yang, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 6, 1977, Ser. No. 830,458
Int. Cl.[2] G01V *1/38*
U.S. Cl. 181—120 **5 Claims**



1. A method for generating an underwater seismic signal, comprising:

surrounding a folded flexible bag by a substantially inexpandable and open frame;

rapidly inflating said bag and rapidly expanding it until it presses on said frame; and

collapsing said bag at a rate much slower than the rate at which it was inflated;

said step of expanding including moving opposite sides of said bag rapidly towards opposite sides of said frame, wherein the center point of said bag will undergo substantially no displacement as a result of said expansion.

4,153,135

APPARATUS FOR THE GENERATION OF ACOUSTIC SIGNALS IN MARINE ENVIRONMENTS

John V. Bouyoucos, Rochester, N.Y., assignor to Hydroacoustics Inc., Rochester, N.Y.

Filed Sep. 30, 1977, Ser. No. 838,415
Int. Cl.[2] G01V *1/04, 1/38*
U.S. Cl. 181—120 **41 Claims**

1. A hydroacoustic source operative when submerged in a marine environment for generating upon successive commands acoustic pulses of controlled amplitude and spectral shape in a precisely timed train of pulses, said source comprising

(a) at least one piston having an outer surface exposed to said marine environment and moveable in opposite directions between an inward and an outward position, for generating successive pulses of said train when said piston reaches said inward position,

(b) a housing having a sleeve disposed around the circumference of said piston and in a sliding relationship therewith to define a region, bounded partially by the inner surfaces of said piston and said sleeve, which region is initially at a pressure which is lower than that which exists in the marine environment in which said source is submerged,

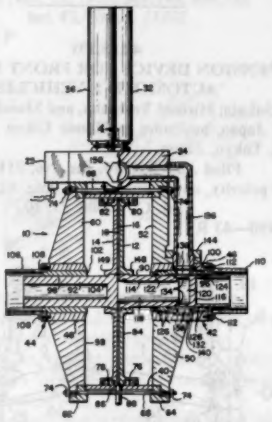
(c) means including said piston defining a mass-spring system having a resonant period at least as short as the shortest interval between said pulses in said train,

(d) said piston having a driving shaft which extends along the central axis of said piston to enter a chamber in said housing in which chamber hydraulic fluid pressures can be applied to said shaft to move the piston between said inward and said outward positions against the ambient pressure of said marine environment,

(e) a channel in communication with said chamber,

(f) means providing pressurized hydraulic fluid at supply and return pressures,

(g) an electrically-controlled hydraulic valve in said channel communicating with said pressurized hydraulic fluid means for selectively connecting said chamber to said hydraulic supply or return pressures and for controlling



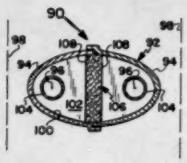
the hydraulic fluid flow between said fluid pressure means and said chamber,

(h) means for operating said valve first to apply supply pressure to said chamber to produce forces on said shaft to move said piston to said outward position, second, and upon a first of said commands, to switch the pressure in said chamber abruptly toward return pressure and to control the flow through said valve as said piston moves inwardly from said outward position so that rebound of said piston off said spring system at said inward position occurs at a prescribed time corresponding to a pulse of said train, third, to switch the pressure in said chamber toward supply pressure during the interval when said piston is in the vicinity of said inward position and while piston velocity is near zero thereby to assist piston rebound, fourth, to switch the pressure in said cavity to return at a predetermined time to decelerate the piston so that the piston approaches its outward position with piston velocity simultaneously approaching zero, and fifth, to switch cavity pressure to supply to hold the piston in its outward position until the next of said commands.

4,153,136
MUFFLER

Michael W. Ferralli, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Division of Ser. No. 698,648, Jun. 22, 1976, Pat. No. 4,109,752.
This application Jun. 30, 1978, Ser. No. 921,131
Int. Cl.[2] F01N *1/04, 1/00, 7/16*
U.S. Cl. 181—252 11 Claims



1. A muffler comprising:

(a) a tubular shell having an interior circumferential surface which is acoustically reflective and which in successive sections taken transversely through the shell has at least a portion of its circumference shaped substantially to define at least part of a parabola;

(b) means defining a fluid inlet into the shell;

(c) means defining a fluid outlet from the shell;

(d) means defining a fluid flow path that extends lengthwise through the shell between the inlet and the outlet along a first axis; and

(e) a sound absorptive treatment disposed within the shell along a second axis extending lengthwise through the shell,

the fluid flow path being defined such that communication is afforded between the flow path and the sound absorptive treatment, the treatment being spaced from the fluid flow path and spaced from at least a portion of the interior circumferential surface of the shell, the treatment also occupying within the shell a volume that is less than the total volume enclosed by the shell minus total volumes occupied within the shell by the fluid flow path and the means defining the fluid flow path,

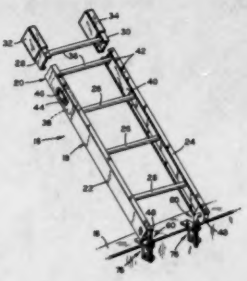
at least one of said first and second axes being defined by corresponding focal points of successive transverse sections taken through said portion of the circumference of the acoustically reflective shell surface, said axes being disposed relative to each other such that at least a portion of any sound emitted from fluid flowing along the flow path is reflected by said reflective shell surface to said sound absorptive treatment.

4,153,137
BOAT LADDER

Edward H. Johnson, 3050 NE. 48 St., #101, Ft. Lauderdale, Fla. 33308

Filed Sep. 20, 1978, Ser. No. 944,174
Int. Cl.[2] B63B *27/14, 29/20;* E06C *5/40*
U.S. Cl. 182—97 10 Claims

1. In combination, a boat having a gunwhale, a pair of spaced brackets mounted on the gunwhale and having openings therein, a ladder section comprising two rails and at least one rung extending therebetween, the bottom ends of said rails having elongate mounting members pivotally received therein for pivotal movement about axes perpendicular to the ladder rails, said elongate members being received in said openings,

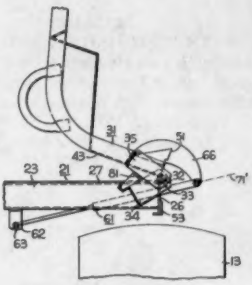


one of said elongate members and said brackets having means to maintain the ladder upright even if the gunwhale slopes.

4,153,138
LADDER HINGE AND STABILIZER THEREFOR

Maynard E. Walberg, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 29, 1977, Ser. No. 837,994
Int. Cl.[2] E06C *5/06, 5/24*
U.S. Cl. 182—98 8 Claims



1. In a vehicle having a frame supporting an elevated operator's station and presenting a horizontal deck at one side of said station, the combination comprising:

a ladder having its upper end pivotally connected to said deck for up and down swinging movement about a horizontal axis between a lowered position and a raised, inverted transport position and

a linear gas spring mechanism operatively interposed between said frame and said ladder for applying force in a plane transverse to said axis, the line of force applied to said ladder by said gas spring mechanism passing above said axis when said ladder is in its lowered position and passing below said axis when said ladder is in its inverted transport position, said gas spring mechanism being disposed beneath said deck.

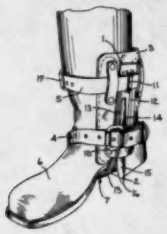
4,153,139
NON ADJUSTABLE CLIMBER

Melvin J. Houch, 10823 75th St., Kenosha, Wis. 53140

Filed Apr. 19, 1978, Ser. No. 897,856
Int. Cl.[2] A63B *27/00*
U.S. Cl. 182—221 4 Claims

1. A climber comprising a bar formed of a metal strip bent to provide a stirrup portion for embracing the boot of a wearer and a substantially straight upwardly extending leg portion on the inner side thereof, and a chanular gaff having its free edges

welded to said leg portion for nearly the full length of the latter to stiffen the same, the lower end of said gaff extending freely away from said stirrup and being tapered generally to a point directed angularly away from said stirrup with the lower end



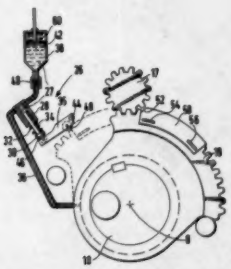
of the gaff approaching the point having a substantially inverted V cross section for penetration of an object in climbing by a cutting action providing a minimum of injury to the object.

4,153,140

LUBRICATION TECHNIQUE AND APPARATUS

René N. Mahr, Howald-Hesperange, and Giovanni Cimenti, Luxembourg, both of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Jul. 25, 1977, Ser. No. 818,431
Claims priority, application Luxembourg, Aug. 6, 1976, 75564
Int. Cl.[2] F16N *7/36*
U.S. Cl. 184—6 **12 Claims**



1. Apparatus for providing lubrication to a rotatable shaft positioned within a blast furnace, the shaft to be lubricated having affixed thereto a steerable charge distribution chute, the rotatable shaft being movable with a transversely rotatable member and also having affixed thereto a drive gear whereby the chute will rotate with the member about a first axis and will rotate with the shaft about a second axis transverse to the first axis, said lubrication providing apparatus comprising:

normally inoperative lubricating means mounted for movement with said rotatable member about said first axis;

means affixed to the drive gear for operating said lubricating means when the distribution chute reaches a predetermined angular position; and

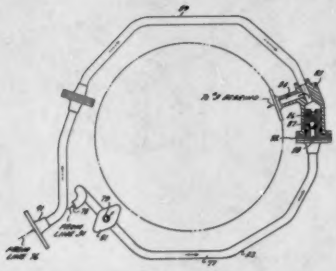
means for delivering lubricant from said lubricating means to the surface of the shaft when said lubricating means is operated by said operating means.

4,153,141

AUXILIARY OIL SUPPLY SYSTEM

Jan E. Methlie, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jun. 20, 1977, Ser. No. 808,209
Int. Cl.[2] F01M *11/12*
U.S. Cl. 184—6.2 **9 Claims**



7. An improved method of lubricating a bearing during periods in which the oil supply from a main oil lube system is interrupted comprising the steps of:

(a) providing an auxiliary oil tank which maintains a supply of oil under pressure;

(b) providing an oil supply line from said auxiliary oil tank to the bearing; and

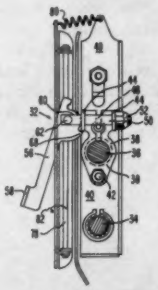
(c) opening a valve in said oil supply line by reducing the pressure on the discharge side thereof during periods of oil interruption to provide an emergency supply of oil to the bearing.

4,153,142

PAPER FEED TRACTOR LOCKING APPARATUS

Albert S. Spisz, Livonia, and Daniel J. Woods, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 16, 1978, Ser. No. 869,835
Int. Cl.[2] F16D *49/16*
U.S. Cl. 188—75 **4 Claims**



1. Paper feed tractor quick lock and release apparatus adapted to be positioned intermediate the edge perforations of material to be printed comprising,

clamping means having a fixed end portion secured to s..'d tractor and an opposite, bifurcated, open end portion terminating in oppositely disposed tangs,

the central portion of said clamping means being provided with an opening enabling said clamping means to surround a fixed support member along which said clamping means and said tractor are non-rotatably, slidably movable,

tang adjusting means extending between said tangs for varying the degree of frictional gripping force between said

clamping means and said support member by varying the opening between said tangs relative to the fixed support member,

one end of said tang adjusting means terminating in a flattened area effective to preventive rotative movement of said tang adjusting means while the opposite end of said tang adjusting means threadedly engages means for closing the opening between said tangs causing said clamping means to grip said support member, and

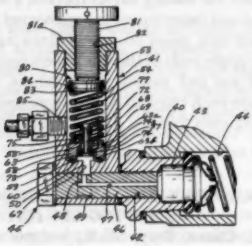
snap release handle means rockably disposed adjacent to said flattened area and including a cam surface engaging said tang adjusting means effective in one position of said release means to permit the natural spring force of the material to spread said tangs apart releasing said clamping means and in another position of said release means effective to forceably draw said tangs together so as to clamp said tractor along said support member.

4,153,143

TRAILER BRAKE ACTUATING ASSEMBLY

Frank A. DePuydt, and Eugene P. Conradi, both of Des Moines, Iowa, assignors to Dico Company, Inc., Des Moines, Iowa

Filed Jan. 12, 1978, Ser. No. 868,940
Int. Cl.[2] B60T 7/20
U.S. Cl. 188—122 R **1 Claim**



1. A hitch and trailer brake assembly, for a trailer and tractor combination, for selectively actuating the brake system of said trailer, said assembly comprising:

a. a pair of telescoping members, a first of which is secured to the tractor and the second of which is secured to the trailer;

b. coacting means on said first and second members limiting the relative longitudinal contracting and expanding movement therebetween;

c. hydraulic means mounted on said second member engageable with said first member on contracting movement of said first member relative to said second member to provide a source of fluid at a pressure that is progressively increased in response to said contracting movement;

d. valve means for maintaining the trailer brake system inoperative until the pressure of the fluid supplied by the hydraulic means reaches a predetermined pressure, whereupon said valve means is actuated to provide fluid to said brake system at a pressure equal to or greater than said predetermined pressure,

e. said valve means including a valve body having a chamber means therein with an inlet port and an outlet port;

f. a valve assembly for opening and closing said inlet port;

g. yieldable valve means for closing said inlet port until the pressure of the fluid supplied by the hydraulic means is greater than the pressure exerted on said valve member by said yieldable means;

h. said yieldable means including a primary valve member having a bleed passage therein open at one end to said inlet port and at the opposite end thereof to said chamber means, and

i. a secondary valve member movably supported on said primary valve member for controlling the flow of fluid through said bleed passage,

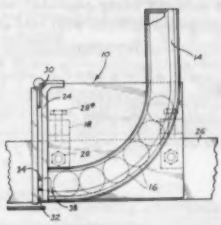
j. said secondary valve member operable to open said bleed passage whereby to equalize the fluid pressure on opposite sides of said valve means when the pressure of the fluid applied on the brakes of the trailer brake system is greater than the pressure of the fluid supplied by said hydraulic means.

4,153,144

IMPACT ABSORBING DEVICE

Jack K. Rhodes, 4500 Pleasant Hill Rd., Kelso, Wash. 98626

Filed Nov. 7, 1977, Ser. No. 849,505
Int. Cl.[2] F16F 7/10
U.S. Cl. 188—266 **8 Claims**



1. An impact absorbing device comprising

a frame,

an impact receiving member pivotally mounted on said frame for swinging movement between a substantially vertical at rest position and an impact position, said impact receiving member having a striker portion thereon,

an upwardly inclined track attached to said frame and having an open end adjacent said impact receiving member,

a plurality of weighted energy transfer members including a lower transfer member adjacent said open end, said members being freely movable in said track for upward movement therein in response to movement of said impact receiving member from its said at rest position to its said impact position whereby impact between said striker portion and said lower member occurs upon an impact occurring with said impact receiving member, and reciprocal downward movement therein following such impact, and

stop means limiting downward movement of said lower member to a position spaced from said striker portion when said impact-receiving member is in its said at rest position.

4,153,145

HEAVY DUTY HYDRAULIC SHOCK ABSORBER

Larry C. Ellis, Farmington Hills, and John S. Ellis, Union Lake, both of Mich., assignors to Ace Controls, Inc., Farmington, Mich.

Filed Dec. 30, 1977, Ser. No. 865,962
Int. Cl.[2] F16F 9/42, 9/44, 9/346
U.S. Cl. 188—274 **5 Claims**

1. A shock absorber comprising:

(a) an outer tube enclosed by a rear head and a front head;

(b) an inner tube mounted in said outer tube and enclosed at its ends by said heads;

(c) a piston assembly, including a piston rod slidably mounted in said inner tube through said front head;

(d) an impact receiving button on the outer end of said piston rod for receiving loads to be decelerated;

(e) a chamber formed interior of said outer tube and between said inner tube and outer tube;

(f) a plurality of longitudinally spaced metering orifice

means formed through said inner tube and communicating said inner tube with said chamber;

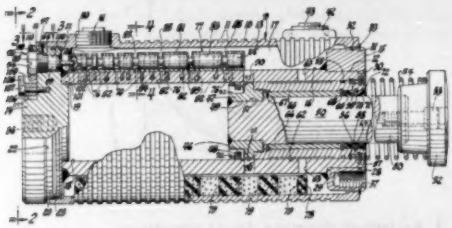
(g) a metering means in said chamber for regulating flow of fluid through said orifice means when the piston assembly is moved inwardly in said inner tube by a load on said button;

(h) a fluid return passage means for returning the fluid from said chamber to said inner tube when the piston assembly is moved outwardly of said inner tube after said load is decelerated;

(i) each of said metering orifice means includes a set of transverse, parallel orifices disposed on a common diameter plane;

(j) said metering means for regulating flow of fluid through said orifice means including a sleeve member mounted on the outer side of said inner tube over said orifices, and a slidable metering spool mounted in said sleeve member;

(k) said sleeve member being provided with slot means for communicating said orifices with said chamber;



(l) said metering spool being provided with a plurality of annular grooves for regulating the opening of said slot means for controlling the flow of fluid from said orifices and through said slot means and into said chamber;

(m) an adjusting screw means connected to said metering spool for adjusting said metering spool in said sleeve member;

(n) said slot means in said sleeve member including a plurality of first slots formed on the inner side of the sleeve member adjacent the inner tube, with each of said first slots being disposed over one of said sets of parallel orifices;

(o) said slot means in said sleeve member further including a plurality of second slots, aligned with said plurality of first slots, and being formed diametrically opposite to said plurality of first slots and communicating with said chamber; and,

(p) means for retaining said adjusting screw means in an adjusted position.

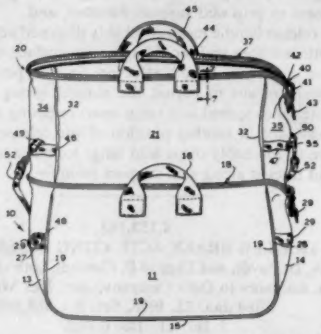
4,153,146

EXPANDABLE LUGGAGE BAG

James S. Patton, Yardville, N.J., and Richard W. Housel, New Hope, Pa., assignors to Atlantic Products Corporation, Trenton, N.J.

Filed Nov. 30, 1977, Ser. No. 855,648
Int. Cl.[2] A45C 7/00
U.S. Cl. 190—44 **5 Claims**

1. In an expandable bag constructed of flexible material having a main section and a secondary, expansible section which is retained within the main section when the bag is in its non-expanded condition, the improvement comprising, said main section having a generally rectangular bottom panel, each of the main and secondary sections having two generally rectangular side panels and two generally rectangular end panels joining said side panels, the upper edges of said side and end panels defining together a horizontal opening such that in the fully opened position of each of the main and secondary sections the bag assumes an oblong configuration and in the fully closed position, said side panels collapse to permit progresive upward tapering of the bag, each of the main and secondary sections including a zipper closure member having mating halves secured to the upper periphery of side and end panels, a zipper slide to effect engagement of the mating halves of the zipper beginning at one end panel and ending at the opposite end panel, in the fully closed position the start and finishing ends of said zipper together with the upper underlying portions of said side panels projecting for a short distance laterally of each end of the bag, a tab connected to the starting end of the



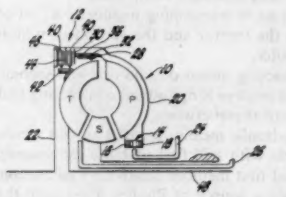
zipper to join the mating halves thereof, a tab connected to the zipper slide and fastening means connected to each of said tabs and to each side panel to permit drawing and securing the projecting upper ends of the side panels against an intermediate portion of the end panels, and wherein the zipper closure members are each one-half of a conventional zipper assembly, the finishing ends forming a continuous, closed loop.

4,153,147

TORQUE CONVERTER AND TORQUE ENGAGED SLIPPING CLUTCH

Howard E. Chana, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1977, Ser. No. 845,644
Int. Cl.[2] F16H 45/02
U.S. Cl. 192—3.28 **3 Claims**



1. A drive system having a torque converter for transmitting fluid power and a mechanically engagable slipping clutch in parallel therewith for transmitting mechanical power comprising; an input member adapted to be driven by a prime mover power source; an output member; an impeller; a turbine member drivingly connected to said output member and cooperating with said impeller to transmit fluid power from said impeller to said output member; clutch apply means connected to said impeller; cam means having interengaging elements on said input member and on said clutch apply means, respectively, for transmitting drive torque from the input member to the impeller and effective to axially shift the clutch apply means in accordance with the drive torque forces; clutch means having frictionally engaging faces connected to said input member and to said turbine so as to establish an independent drive path therebetween as the clutch apply means is axially shifted, whereby axial movement of the clutch apply

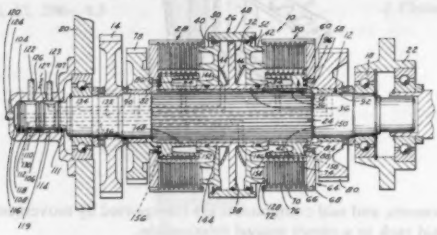
means in response to the torque transmitted by said cam means engages said clutch means to provide a torque split between said torque converter and said clutch.

4,153,148

CLUTCH WITH REPLACABLE DISC AND MOTOR ASSEMBLIES

Eugene F. Malinowski, Milford, Mich., assignor to D. A. B. Industries, Inc., Troy, Mich.

Filed Jun. 2, 1977, Ser. No. 802,680
Int. Cl.[2] F16D *25/10*
U.S. Cl. 192—87.17 **4 Claims**



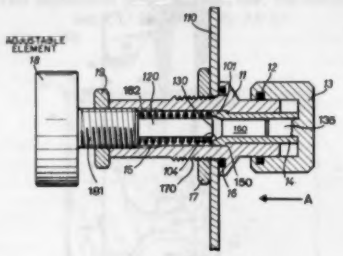
1. A clutch for a shaft comprising an actuating pack and a reaction pack, said actuating pack comprising (1) a piston support structure having central actuating hub means (2) a piston, (3) housing means and (4) retaining means holding said piston support structure, piston and housing means together to constitute said actuating pack as a self-contained unit when removed from said shaft, said actuating hub means having an opening therethrough for slidable reception on a shaft, said actuating hub means being longitudinally elongated, said opening having longitudinally extending means therein for engagement with structure on a shaft for rotation of the actuating pack with a shaft, said piston being slidably received on the actuating hub means, said housing means being received on the actuating hub means and receiving the piston, said housing means forming, with the piston and piston support structure, a fluid tight chamber, one end of said housing means having opening means for extension and retraction of portions of the piston for actuation of the reaction pack, and means for supplying liquid under pressure to said fluid tight chamber to cause movement of said piston longitudinally outwardly of said housing means, said reaction pack including (1) reaction hub means (2) at least one first clutch disc, (3) casing means, (4) at least one second clutch disc and (5) retaining means holding said reaction hub means, said one first clutch disc, said casing means and said one second clutch disc together to constitute said reaction pack as a self-contained unit when removed from said shaft, said reaction hub means having an opening therethrough for slidable reception on a shaft in adjacent relationship to said actuating pack, said reaction hub means being longitudinally elongated, said opening in the reaction hub having longitudinally extending means therein for engagement with structure on a shaft for rotation of the reaction pack with a shaft, said first clutch disc being non-rotatably but axially slidably mounted on said reaction hub means, said casing means extending over said reaction hub means and first and second clutch discs, said second clutch disc being non-rotatably but axially slidably mounted on said casing means, a power transmitting device on said casing means, means for journalling said power transmitting means on a shaft, one end of said casing means having opening means for extension therein of said portions of the piston for causing clutching engagement of said clutch discs, said actuating pack unit and reaction pack unit being physically independent of one another, each being individually removable from or mountable on said shaft as a unit whereby said packs are interchangeable at will.

4,153,149

ADJUSTING KNOB DEVICE FOR ELECTRICAL INSTRUMENTS AND THE LIKE

Eugen Weber, Hinwil, Switzerland, assignor to Orbisphere Corporation, Wilmington and Succursale de Collonge-Bellerive, Manior de Bonvent Collonge-Bellerive, Switzerland

Filed Jan. 23, 1978, Ser. No. 871,630
Claims priority, application Switzerland, Feb. 1, 1977, 1169/77
Int. Cl.[2] F16D *23/00*; G05G *11/00*
U.S. Cl. 192—95 **5 Claims**



1. An adjusting device comprising a normally freely turnable adjusting knob capable of temporary actuation for changing the setting of an adjustable element, a stationary mounting hub, said adjusting knob being formed as a hollow capsule rotatably arranged around and receiving one end of said stationary mounting hub, sealing means between an inner side of said knob and said mounting hub and located near an open end of said knob so as to protect the interior of said mounting hub from penetration of water and contaminants, a normally disengaged clutch means provided within said mounting hub and connected with said knob for temporary engagement of said knob and said adjustable element, a spring arranged within said mounting hub engaging a freely turnable hollow shaft, said shaft being connected with said knob, said clutch means being actuated when said knob is pressed against said spring, an actuating shaft provided for said adjustable element, said clutch means comprising said normally freely turnable shaft, one end of which is connected with said knob and the other end of which is provided with a clutch face for temporary engagement with said actuating shaft, said actuating shaft extending into said mounting hub at an end thereof opposite said one end of said mounting hub received in said knob.

4,153,150

COIN OPERATED LOCK

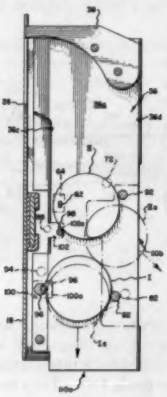
Douglas A. Barth, Sinclairville, and Richard J. Chester, Kennedy, both of N.Y., assignors to American Locker Security Systems, Inc., Jamestown, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,397
Int. Cl.[2] G07F *1/04*
U.S. Cl. 194—92 **8 Claims**

1. In a coin operated lock of the type having a coin chute formed with vertically spaced coin inlet and discharge ends and serving to constrain coins for movement on edge downwardly therethrough, means for limiting passage of coins through said inlet to coins of a diameter equal to or less than a given diameter of a given denomination coin of a given currency intended to operate said lock, a coin selector mechanism having a coin intercepting finger arranged relatively adjacent said discharge end and operative when in a gauging position for supporting at least certain of the coins deposited in said chute, and a coin sensing means arranged relatively adjacent said inlet end for sensing the presence of a coin supported in said chute when in alignment therewith, characterized in that said lock may be moved from an unlocked into a locked condition only upon the sensing of the presence of a coin by said coin sensing means whereafter said coin intercepting finger is

moved to a release position for releasing coins supported in said chute for discharge therefrom, the improvement comprising in combination:

said coin selector mechanism includes additional gauging means cooperating with said intercepting finger when in its gauging position for supporting a first deposited coin of said given denomination within said chute and supporting a second deposited coin of said given denomination within said chute above said first deposited coin and in alignment



with said coin sensing means, while permitting discharge from said chute of improper coins of a diameter less than said given diameter when deposited before said second deposited coin, said intercepting finger upon movement thereof into its release position releasing said first deposited coin for discharge from said chute, and said additional gauging means being responsive to release of said first deposited coin for releasing said second deposited coin for discharge from said chute.

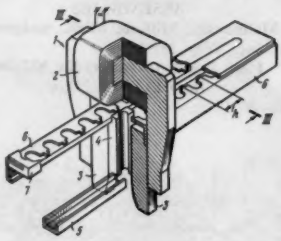
4,153,151

DEVICE FOR ARRANGING FERROMAGNETIC COMPONENTS AT PRESET DISTANCE FROM ONE ANOTHER

Anton Y. Kulberg; Robert K. Kalnin; Benyamin A. Ioffe, all of Riga; Semen K. Litvinenko, and Roman S. Leikin, both of Kurgan, all of U.S.S.R., assignors to Institut Fiziki Akademii Nauk Latviiskoi SSR, Latviiskaya and Rizhsky Politekhnichesky Institut, Riga, both of, U.S.S.R.

Filed Apr. 6, 1977, Ser. No. 785,054
Int. Cl.[2] B65G *35/00*
U.S. Cl. 198—456 **6 Claims**

1. A device for arranging ferromagnetic components a preset distance from one another, comprising: an electromagnet and at least two pole pieces defining an elongated symetrical pole gap having an axis of symmetry, said electromagnetic being provided with a means for creating in said pole gap a nonuniform attractive magnetic field whose gradient is directed along said axis of symmetry of said pole gap, a component feeding means whose exit end is disposed in said magnetic field near said axis of symmetry of said pole gap, said component feeding means adapted for feeding said ferromagnetic components in the direction of said gradient of said magnetic field, a ferromagnetic rack moveably mounted on at least one of said pole pieces near said exit end of said feeding means so that the plane in which said rack lies is substantially normal to the direction of said magnetic field gradient, said rack being mounted to move in said plane and including a plurality of teeth which are spaced a preset distance, whereby said ferromagnetic components are maintained at the location of said teeth by magnetic force without said teeth engaging said com-



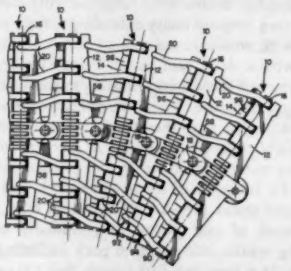
ponents, and said components are transported by movement of said rack in a preset spaced relationship.

4,153,152

BI-DIRECTIONAL HINGED CONVEYOR BELT

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Feb. 14, 1977, Ser. No. 768,531
Int. Cl.[2] B65G *17/06*
U.S. Cl. 198—851 **23 Claims**



1. A bi-directionally movable multiple link conveyor comprising:

a plurality of modular links each having:

a first integral central linking portion terminating in first and second linking ends disposed along a conveyor axis;

a second integral central linking portion terminating in third and fourth linking ends disposed along said conveyor axis;

first and second arms extending outwardly along a first axis transverse to said conveyor axis and being integrally formed with said first linking portion;

third and fourth arms extending outwardly along said first axis and being integrally formed with said second linking portion;

a plurality of spaced ribs defining a conveyor surface and attached to only said third and fourth arms of each modular link and being transversley disposed thereon and upstanding therefrom and outwardly extending from the sides thereof substantially along said conveyor axis; and

said second linking end of said first linking portion being pivotally coupled to said third linking end of said sec-

ond linking portion for pivotal movement of said first and second linking portions about said first axis;

said first linking end of each of said links being pivotally coupled to said fourth linking end of an adjacent link for pivotal movement about a second axis orthogonal to said conveyor axis and said first axis.

4,153,153

PRE-GUMMED TEA BAG TAG ASSEMBLY

Michael Herzog, 158 Lynn Ave., Hampton Bays, L.I., N.Y. 11946

Filed Mar. 20, 1978, Ser. No. 888,163
Int. Cl.[2] B65D *85/70*; A23F *1/08*
U.S. Cl. 206—0.5 **3 Claims**

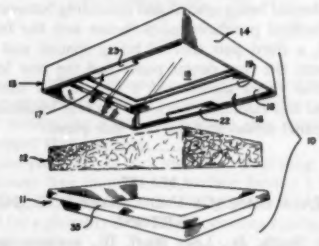
1. A tea bag tag assembly comprising in combination a tea bag attached to one end of a string and a tag attached to an opposite end of said string, said tag including one side thereof coated with a pressure sensitive adhesive covered by a removable protective cover paper for attachment to an outer side of a tea cup, including means for receiving, squeezing and positioning said bag over said cup with the tag attached to the cup to cause fluid from the bag to flow into said cup when squeezed.

4,153,154

JEWELRY DISPLAY CASE

Fredric C. Ruscher, 6113 W. Marlette, Glendale, Ariz. 85301

Filed May 30, 1978, Ser. No. 910,211
Int. Cl.[2] B65D *11/10, 5/50*
U.S. Cl. 206—45.19 **7 Claims**



1. A small, portable display case, for displaying jewelry and the like, comprising:

a. a generally-rectangular bottom container member;

b. a generally-rectangular upper lid member having a viewing hole therein;

c. a transparent retaining member directly beneath said lid member;

d. a resilient display member, for holding items to be displayed, between said retaining member and said container member; and

e. a connection means for supporting said retaining member directly adjacent said lid member;

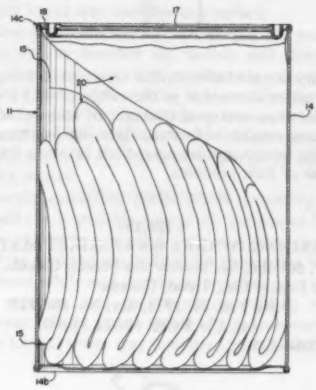
f. said connection means including mechanical means for attaching and detaching said container member from said lid member.

4,153,155

FLUID COLLECTOR AND MULTIPACKAGE SYSTEM

Edward L. Benno, Grayslake, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 779,864, Mar. 21, 1977, abandoned. This application Nov. 25, 1977, Ser. No. 855,034
Int. Cl.[2] B65D *75/00, 25/14*
U.S. Cl. 206—150 **7 Claims**



1. A multipackage comprising an odd numbered plurality of oil cans containing fluid, a used-oil collector and a carrier device, said collector comprising a can of substantially the same size and external configuration as one of said oil cans, said oil cans and said collector arranged in a pattern of parallel rows and ranks perpendicular to said rows, said carrier device comprising a member holding said oil cans and said collector together in a unitary package capable of being carried by a person, said can of said collector having a manually removable and resealable cover and a flexible bag folded therewithin, said can of said collector having a cover rim ring member, the inner periphery of which is adjacent to the inner periphery of the sidewall of said can of said collector, said cover being formed to fluid seal said can of said collector about said rim thereof, the open end of said bag secured about the rim of said can of said collector in a fluid sealed relationship therewith and independently of said cover, a sidewall portion of said can of said collector having a cover being manually removable to permit the major portion of said bag which extends from said open end thereof to be manually drawn from the interior of said can in a fluid receiving relationship to said open end of said bag, and said bag having a capacity at least as large as the total volume of said plurality of oil cans.

4,153,156

METHOD FOR REINFORCING OR SEALING SOLID STRUCTURES OR FOR ANCHORING BOLTS THEREIN AND CARTRIDGES FOR USE IN SUCH METHOD

Ronald W. Seemann, Roseville, and Thomas I. Bradshaw, Shoreview, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 8, 1977, Ser. No. 822,875
Int. Cl.[2] B65D *25/08*; E21D *21/00*
U.S. Cl. 206—219 **12 Claims**

1. A sealing cartridge for reinforcing or sealing solid structure, anchoring bolts or the like comprising a cylindrical array

of pressure fragmentable non-friable macrocapsules in a fixed three dimensional relationship, said cylindrical array having a cross sectional diameter from 5 mm to 10 cm, said macrocapsules (a) containing at least one part of a multi-part curable polymer system which is capable of curing to a hard resin, the

major components of said curable resin system being liquid, (b) having a major dimension in the range of 4.75 mm to about 95% of the cross sectional diameter of said cylindrical array and (c) being capable of forming flake-like fragments from the walls of the macrocapsules upon their pressure fragmentation and release of their contents.

4,153,157

PACKAGING OF GIFT WRAP SHEET MATERIAL

Charles P. deVolpi, St. Sauveur des Monts, Canada, assignor to Perkins Papers Ltd., Laval, Canada

Filed Feb. 22, 1978, Ser. No. 880,122
Int. Cl.[2] B65D *69/00, 71/00*
U.S. Cl. 206—225 **5 Claims**

1. A package of gift wrap material, including a cylindrical core of a predetermined length, a first length of gift wrap sheet material co-extensive with the core and being rolled onto the core, at least a second length of gift wrap sheet material rolled concentrically onto the first length of sheet material and the core exposing a portion of said first length of sheet material.

4,153,158

TWELVE-ARTICLE BASKET CARRIER

Earl J. Graser, Monroe, and Jerry F. Wilson, West Monroe, both of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Jun. 30, 1978, Ser. No. 921,135
Int. Cl.[2] B65D *75/00, 73/00*
U.S. Cl. 206—173 **11 Claims**

1. A foldable carrier for holding twelve articles, comprising

front and rear center panels secured back-to-back and having upper handle portions;

front and rear first end panels hinged at inner edges thereof on first end edges of the respective front and rear center panels;

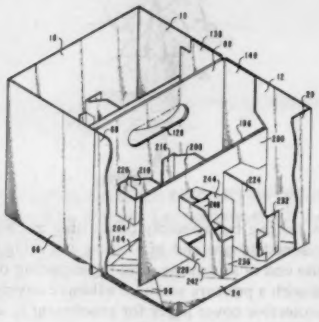
front and rear side panels hinged at first end edges thereof on outer edges of the respective front and rear first end panels;

front and rear full second end panels hinged at outer edges thereof on second end edges of the respective front and rear side panels;

front and rear half second end panels hinged at inner edges thereof on second end edges of the respective front and rear center panels and secured to inside surfaces of inner portions of the respective front and rear full second end panels;

front and rear bottom panel means hinged at outer edges thereof to bottom edges of the respective front and rear side panels and hinged at inner edges thereof to each other;

front and rear longitudinal partition panel means hinged at



second end edges thereof to outer edges of the respective front and rear half second end panels;

said front and rear longitudinal partition panel means extending parallel to and midway between the front center and front side panels and between the rear center and rear side panels, respectively;

said front and rear longitudinal partition panel means having respective tabs at first end edges thereof secured to the respective front and rear first end panels; and

eight transverse partition panels having a first pair thereof being spaced and extending between the front side panel and the front longitudinal partition panel means, a second pair thereof being spaced and extending between the front longitudinal partition panel means and the front center panel, a third pair thereof being spaced and extending between the rear center panel and the rear longitudinal partition panel means and a fourth pair thereof being spaced and extending between the rear longitudinal partition panel means and the rear side panel.

4,153,159

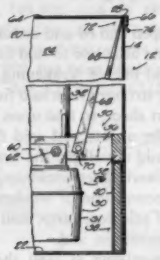
TELLTALE DAMAGE INDICATOR FOR SHIPPING CARTONS

J. Lindley Smith, Jr., Lake Bluff, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 15, 1977, Ser. No. 833,504
Int. Cl.[2] B65D *85/68*
U.S. Cl. 206—319 **12 Claims**

1. A closable shipping carton for an article comprising side walls and an end wall defining an interior compartment for receiving the article, a support member disposed inside said carton and adapted to support the article in a shipping position spaced from at least one of said walls, and non-supporting telltale damage indicating means connected to the article or to said support member and movable therewith for indicating movement of the article relative to said carton from the ship-

ping position, said indicating means including a visible position-indicating portion which, when the article is in the shipping position, extends a predetermined distance exteriorly of said carton in slidable relationship thereto and which, in response to movement of the article from the shipping position after said carton is closed, is pulled inwardly toward said compartment to thereby indicate the amount of movement of the article from the shipping position.

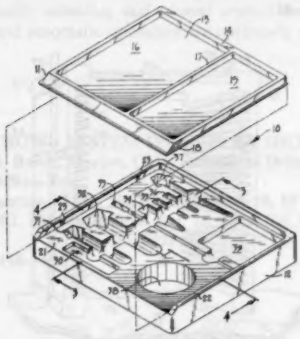


4,153,160

DISPOSABLE SLIDE-STEP PERCUTANEOUS TRANSHEPATIC CHOLANGIOGRAPHY PROCEDURE TRAY

Kay K. Leigh, White Bear Lake, Minn., assignor to Johannah Medical Services, Inc., Minneapolis, Minn.

Filed Jan. 30, 1978, Ser. No. 873,389
Int. Cl.[2] B65D *1/34;* A45C *11/26*
U.S. Cl. 206—370 **3 Claims**



1. A two-member disposable slide-step roentgenological visualization procedure tray for sequentially performing sterile procedures comprising a one-piece lower tray member and a one-piece upper tray member;

(a) said one-piece lower tray member comprising:

(1) a lower tray member top surface having a generally rectangular periphery and being generally planar except for a plurality of article supporting recesses formed therein;

(2) an integral outer peripheral upwardly extending rim-like retaining means surrounding three sides of said lower tray member top surface, and defining an area for the receiving of said one-piece upper tray member in a position juxtaposed upon said lower tray member top surface; said rim-like retaining means extending upwardly from said lower tray member top surface;

(3) an integral, three-sided downwardly depending flange means extending downwardly from the top of said rim-like retaining means down to a generally flat plane below the lowest portion of the deepest or most downwardly extending article supporting recesses to provide a bottom edge serving as an open base for supporting said lower tray member;

(4) a plurality of boss means in said rim-like retaining means spaced above said lower tray member top surface to retain said upper tray member in said area defined by said rim-like retaining means while permitting transversely sliding movement of said upper tray member with respect to said top surface of said lower tray member; and

(b) said one-piece upper tray member being in a juxtaposed position upon said lower tray member top surface and transversely slideably removeable from said juxtaposed position and comprising:

(1) a generally planar, generally rectangular article-supporting upper tray member top surface having a smaller area than said lower tray member top surface;

(2) an integral peripheral rim surrounding the periphery of said upper tray member top surface and extending upwardly from said upper tray member top surface, the area defined by said peripheral rim being smaller than the area defined by said rim-like retaining means, whereby said peripheral rim fits within said area defined by said rim-like retaining means in closely spaced relation to said rim-like retaining means;

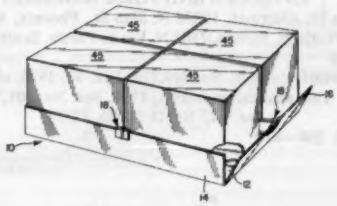
(3) outwardly extending flange means extending outward from said rim to provide a generally peripheral flat planar surface extending outwardly beyond the area of said upper tray member top surface, for positioning below said boss means while said upper tray member is in said juxtaposed position, and for permitting sliding transverse movement of said upper tray member transversely with respect to said lower tray member top surface.

4,153,161

SLIP SHEET RETAINING CLIP

Charles F. Taylor, and Richard J. Taylor, both of 150 E. Industry, La Habra, Calif. 90631

Filed Feb. 6, 1978, Ser. No. 875,680
Int. Cl.[2] B65G *1/14*
U.S. Cl. 206—386 **24 Claims**



11. In combination with a slip sheet having a main body portion on which a plurality of containers are placed, the lateral edges of which main body portion are scored to provide tabs along the peripheral edges thereof, a slip sheet retaining clip comprising:

(a) a clip part for receiving an edge of a slip sheet tab, and

(b) a retaining part engaged with said clip part

(c) said retaining part including a flat body portion extending outwardly at an angle to the plane of said clip part for insertion into the space between adjacent containers

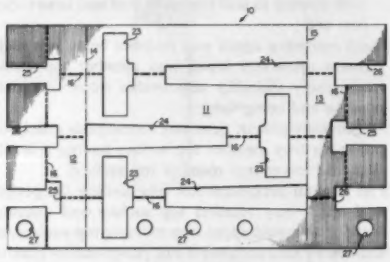
(d) said retaining part further including impinging members extending outwardly from one face of said flat body portion into frictional engagement with a container wall.

4,153,162

PRODUCT DISPLAY CARD

Rolf A. Samsing, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jan. 12, 1978, Ser. No. 868,845
Int. Cl.[2] B65D *73/00, 85/00;* **A45D** *27/24*
U.S. Cl. 206—476 **11 Claims**



1. A product display card having front and rear sides and formed from a one-piece blank, said card holding therethrough one or more generally elongate articles in organized array, each article including opposite end portions and an intermediate portion connecting said end portions and so configured that said end portions are at said front side while said intermediate portion is at said rear side; said card comprising:

a front panel provided with, corresponding to each said article, a pair of front panel cutouts and an uncut portion extending therebetween, each said end portion projecting through one of said front panel cutouts to said front side, at least one said cutout and said end portion projecting therethrough extending substantially to an edge of said front panel; and

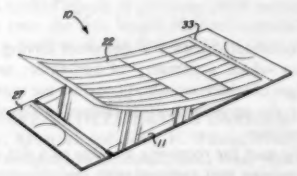
a pair of rear panels foldably joined to said front panel at opposite edges thereof adjacent said end portions and secured in parallel relationship to said front panel, said rear panels provided with rear panel cutouts generally aligned with said front panel cutouts and retaining said end portions at said front side, said uncut portion retaining said intermediate portion of said article at said rear side of said card.

4,153,163

ENVELOPE AND FORM ASSEMBLY

Norman H. Alderman, 10832 N. 38th St., Phoenix, Ariz. 85028, and Willis M. Morris, 7104 N. Via de Paesia, Scottsdale, Ariz. 85258

Continuation of Ser. No. 749,772, Dec. 13, 1976, abandoned.
This application May 1, 1978, Ser. No. 901,722
Int. Cl.[2] B65D *27/00, 27/34*
U.S. Cl. 206—610 **5 Claims**



1. An envelope and form assembly including in combination:

an envelope having a back portion and a cover portion closed on one end and both sides, at least part of the cover portion of said envelope being formed of transparent material;

first and second insert sheets attached to the closed end of said envelope at a first line of weakening;

a plurality of transfer sheets within said envelope, one transfer sheet overlying each of said insert sheets and another transfer sheet overlying the inside of the back portion of said envelope;

a tear strip at the open end of said envelope attached to said transfer sheets and attached to said first and second insert sheets at a second line of weakening, said second line of weakening being stronger than said first line of weakening on said first insert sheet, so that upon removal of said tear strip, said transfer sheets and said first insert sheet are extracted from said envelope, the first line of weakening on the second insert sheet presenting a stronger attachment than the second line of weakening thereon so that upon removal of said tear strip, said second insert sheet remains in said envelope; and

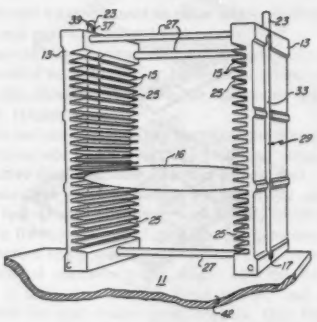
data entry sheet overlying at least the part of the cover portion of said envelope formed of transparent material and having a portion attached to one of said closed and of said envelope and said tear strip at a third line of weakening to permit detachment of said entry sheet after the impression of data thereon to transfer such data to said insert sheet and the inside of the back portion of said envelope by said transfer sheets.

4,153,164

CARRIER FOR SEMICONDUCTIVE WAFERS

Lucien Hofmeister, Mountain View, and Harvey L. Schulte, Los Altos, both of Calif., assignors to Kasper Instruments, Inc., Sunnyvale, Calif.

Filed Jun. 13, 1978, Ser. No. 915,277
Int. Cl.[2] B23P *17/00;* **A47G** *19/02*
U.S. Cl. 211—41 **6 Claims**



1. A carrier for preventing spillage of workpieces contained therein, said carrier comprising:

a pair of side plates coupled together for forming a plurality of transport channels, at least one of said side plates having a recessed region extending partially into the transport channels;

a stop member pivotally mounted in the recessed region for automatic movement between an inoperative position out of the transport channels to permit passage of the workpieces therealong when the carrier is set down and an operative position protruding into the transport channels to block passage of the workpieces therealong and prevent spillage of the workpieces from the carrier when it is picked up; and

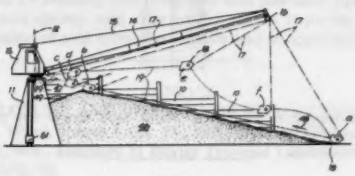
a self-locking mechanism operable for automatically preventing the stop member from moving to the operative position when the carrier is picked up and for automatically releasing the stop member when the carrier is set down.

4,153,165

SCRAPER

Georg Thierer, Bad Schönborn, and Hans Dolinsek, Stuttgart, both of Fed. Rep. of Germany, assignors to Firma Johannes Fuchs, Ditzingen, Fed. Rep. of Germany

Division of Ser. No. 715,431, Aug. 18, 1976, Pat. No. 4,099,631. This application Dec. 13, 1977, Ser. No. 861,442
The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.
Int. Cl.[2] B65G *65/28*
U.S. Cl. 414—133 13 Claims



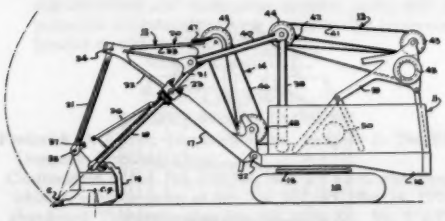
1. Apparatus for scraping piled-up particulate material against a radial feeder comprising a scraper mounted on a support portion of said feeder, an arm pivotably mounted on said support, a scraper bucket suspended from said arm by a lifting cable line connected to a lifting winch, a digging cable line connected at one end thereof to said bucket and at the other end thereof to a digging winch, motor means for driving said winches, clutch means for connecting said winches with said motor means, brake means for braking said winches, manual control means for directly manually actuating said clutch means and said brake means through linkage means interconnecting said manual control means with said clutch means and said brake means respectively, and power-controlled means for automatically actuating said manual control means, whereby manual and automatic operation are optionally selectable.

4,153,166

CROWD SYSTEM FOR POWER SHOVELS

George B. Baron, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 559,963, Mar. 19, 1975, Pat. No. 4,044,903. This application Jun. 15, 1977, Ser. No. 807,421
Int. Cl.[2] E02F *3/32, 3/30*
U.S. Cl. 414—695 9 Claims



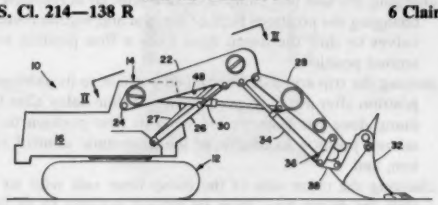
1. In a power shovel having a support means and a front end assembly including a dipper adapted to be crowded and hoisted to perform digging operations, operatively mounted on said support means, a crowd system comprising a mast pivotally connected to said support means, means operatively interconnecting said mast and said front end assembly for transmitting motion from said mast to said front end assembly, a gantry mounted on said support means, rotary drive means mounted on an upper end of said gantry and means for translating rotary motion of said rotary means to pivotal motion of said mast, said motion translating means including means for directly transmitting motion from said rotary drive means to said mast.

4,153,167

CROSS TUBE CONSTRUCTION

Stephen H. Gill, Mentor, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 7, 1977, Ser. No. 813,729
Int. Cl.[2] E02F *3/38*
U.S. Cl. 214—138 R 6 Claims



1. A shovel linkage for a hydraulic excavator or the like comprising a boom pivotally attached to the excavator, a stick pivotally connected to said boom, said boom and said stick comprising spaced parallel rails, and cross tubes connecting said rails, wherein said cross tubes include a bracket means for connection of hydraulic cylinder means thereto, said hydraulic cylinder means and said bracket means are so arranged that the cylinder means will exert forces on the cross tubes which extend through the center thereof; and

wherein the cross tubes include a diametral backing member disposed along a diameter of the tube coincident with forces exerted on the tube by the hydraulic cylinder means attached to the respective bracket means; and

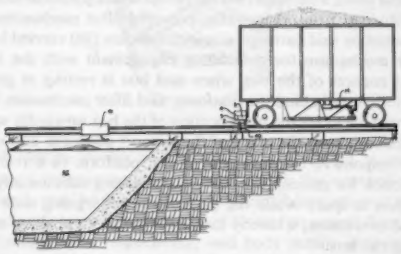
wherein said cross tube comprises arcuate cylindrical members and a bracket member joined circumferentially to define a cylindrical tube, and wherein said diametral backing member extends across a diameter of the tube from a juncture of the arcuate members to the bracket member, and wherein said bracket member includes an outstanding tab portion having a pivot journal provided therein.

4,153,168

AUTOMATIC HOPPER DOOR OPENER

Walter C. Reustle, 4824 Valley View Ct., Dunwoody, Ga. 30338

Filed Sep. 29, 1977, Ser. No. 837,939
Int. Cl.[2] B61D *7/08*
U.S. Cl. 414—786 2 Claims



1. A method of controlling the dump door of a moving vehicle comprising the steps of:

moving the vehicle bearing a protruding trip arm along a predetermined path past a wayside latch tripping means,

making contact between the trip arm and the latch tripping means to shift the trip arm from an untripped to a tripped position,

charging a pneumatic control system with air in response to shifting the trip arm from its untripped position to its tripped position,

changing the position of a first control valve in response to charging the pneumatic control system with air after a first predetermined time delay,

moving the vehicle further along the predetermined path past a wayside magnetic field induction means,

changing the position of a second control valve in response to the movement of the vehicle past the wayside magnetic field induction means,

charging one side of a dump door ram with air in response to changing the positions both of the first and second control valves to shift the dump door from a first position to a second position,

moving the trip arm from its tripped position to its untripped position after a second predetermined time delay after the dump door has been shifted from its first position to its second position to discharge the pneumatic control system, and

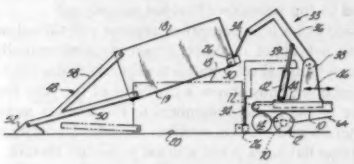
charging the other side of the dump door ram with air to shift the dump door from its second position to its first position.

4,153,169

LOADING-UNLOADING CAPABILITY FOR CARGO BOX TRANSPORT VEHICLE

Jerome T. Cipkowski, Warren, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1978, Ser. No. 903,432
Int. Cl.[2] B60P *1/00*
U.S. Cl. 414—442 **5 Claims**



1. In a self-loading vehicle for transporting a multi-ton cargo box: the improvement comprising an elongated horizontal vehicle platform (**10**) having front and rear ends with a longitudinal axis extending therebetween; ground wheels (**12,14**) at the platform rear end for supporting said platform above ground level; a carriage (**44**) movable on said platform along its longitudinal front-to-rear axis; powered lifter mechanism (**33**) mounted on said carriage; connector means (**26**) carried by the lifter mechanism for detachable engagement with the lower front corners of the box when said box is resting at ground level directly behind the platform; said lifter mechanism being energizable to lift the front portion of the box upwardly so that the box is above the plane of the support platform; and means (**35**) responsive to movement of the platform in a rearward direction for causing the carriage to remain substantially motionless in space while the platform is undergoing such rearward movement, whereby the platform takes a position underlying the box.

4,153,170

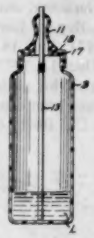
APPARATUS FOR WEANING CHILDREN

Star T. Aquarian, 122 Serra St., #A, San Clemente, Calif. 92672

Filed May 2, 1977, Ser. No. 793,072
Int. Cl.[2] A61J *9/00*
U.S. Cl. 215—11 R **1 Claim**

1. In a baby bottle assembly including a bottle, a flexible nipple conformed to engage the opening in said bottle and means for securing said nipple to said bottle, the improvement comprising:

a drinking straw receivable in said bottle extending partly through said nipple to project beyond the end of said nipple in a projection dimensioned for receipt in the mouth of an infant when the infant grasps said nipple with its lips, said nipple being provided with an orifice of a sectional dimension just smaller than said straw, whereby



said nipple is stretched about said straw for retention thereof in said bottle.

4,153,171

RESIN-COATED GLASS ARTICLES

R. James Kersting, and James J. Harris, both of Pittsburgh, Pa., assignors to Arco Polymers, Inc., Philadelphia, Pa.

Filed Jul. 17, 1978, Ser. No. 925,509
Int. Cl.[2] B65D *11/16;* B32B *17/10*
U.S. Cl. 215—12 R **2 Claims**

1. A resin:coated glass article consisting of a glass having on its outer surface a 4–7 mil thick film of a polymer composition made from 91.5 to 98.5 mole percent of total polymer of ethylene, 0.0 to 2.5 mole percent of 1-butene, and 1.5 to 6.0 mole percent of a monomer selected from the group consisting of 2-norbornene, 5-methyl-2-norbornene, and 5-ethyl-2-norbornene; said polymer composition having a density of between 0.930 and 0.950 grams per cubic centimeter and a narrow molecular weight distribution of less than 10 as measured by the ratio of melt index under 10 kilograms load to melt index under 2 kilograms load at 190° C.

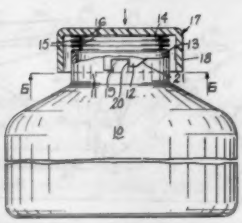
2. The glass article of claim **1** wherein the article is a bottle.

4,153,172

CONTAINER SAFETY CLOSURE

Walter Bialobrzeski, 68 Summerwood Rd., Wallingford, Conn. 06492

Continuation-in-part of Ser. No. 387,948, Aug. 13, 1973, abandoned. This application May 2, 1978, Ser. No. 902,240
Int. Cl.[2] B65D *55/02, 85/56;* A61J *1/00*
U.S. Cl. 215—209 **7 Claims**



1. In a closure for containers wherein the application and removal of the closure require forcible axial movement of a closure element relative to the container top, a closure comprising an outer element adapted for manual manipulation and a spring element interposed between the outer element and a portion of the container in a position to resist axial movement of said outer element toward said container, the spring element being of a hollow body of resilient plastic material having convolutions along the length thereof, said element being hollow with at least one end unenclosed, said convolutions having inner and outer ridges, the inner ridges defined on first

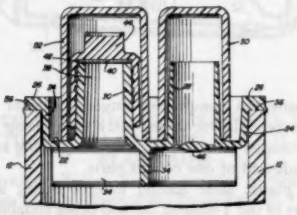
radii which determine the thickness thereof, the outer ridges defined on second radii, said thicknesses being of unequal dimension whereby the wall portions extending between said ridges are of tapering thickness whereby the radii and varying wall thickness determine the spring characteristics of said spring element, said spring being precompressed along said longitudinal axis to give it a permanent set of decreased axial dimension in an unloaded condition, the predominant preset of said spring occurring in the thinner walled ridges, said convolutions being of essentially annular shape perpendicular to the longitudinal axis, and cooperating means on said closure and container for latching said closure to said container against the bias of said spring, said cooperating means requiring further compression of said spring to unlatch said cooperating means.

4,153,173

CAP CLOSURE AND METHOD OF PRODUCING SAME

Gary A. Ward, Round Lake, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 13, 1978, Ser. No. 885,480
Int. Cl.[2] B65D *41/50*
U.S. Cl. 215—232 **17 Claims**



1. A cap closure for bonding to the neck of a container, which comprises:

a base portion enclosed by a side wall;

a peripheral rim extending outwardly from and connected to said side wall, said rim being adapted for bonding to the neck of the container;

an administration port connected to said base portion;

a medication addition port connected to said base portion;

a resealable injection site connected to said medication addition port; and

port protector means covering and hermetically sealing said administration and medication addition ports, said port protector means comprising a protector cap hermetically bonded to said base portion.

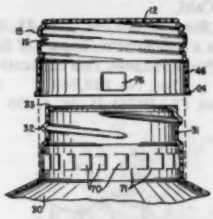
4,153,174

TAMPER-PROOF CLOSURE

Frederick D. Keeler, Trumbull, Conn., assignor to The KLM Company, Stratford, Conn.

Continuation of Ser. No. 632,763, Nov. 17, 1975, abandoned, which is a continuation of Ser. No. 357,493, May 14, 1973, abandoned. This application Jan. 31, 1978, Ser. No. 873,978
Int. Cl.[2] B65D *41/34*
U.S. Cl. 215—252 **18 Claims**

1. A tamper proof closure for a container, said closure comprising a thermoformed single integral piece of sheet thermoplastic material formed with a top wall and a flexible skirt wall depending therefrom, means formed on said skirt wall adapted for fastening to mating means on a container, said closure being thermoformed remote from the container and being of substantially uniform thickness throughout except in the areas where deformed, the thermoplastic material of the closure skirt wall being cut and bent inwardly to form a tab in the closure skirt wall from the material of the skirt wall, said tab being attached to the skirt wall along a hinge line which is fomed by moving the tab inwardly of the skirt wall and setting it in a fixed position by stressing the thermoplastic material along the hinge line, said tab having a free end which extends inwardly of the



skirt wall adapted for engaging a portion of the container so that said tab will be broken from the skirt wall along said hinge line as the closure is unfastened from the container.

4,153,175

POURING CLOSURE FOR LIQUIDS

Sidney M. Libit, 441 Lakeside Ter., Glencoe, Ill. 60022

Division of Ser. No. 688,989, May 24, 1976, Pat. No. 4,077,537. This application Dec. 19, 1977, Ser. No. 862,017
Int. Cl.[2] B65D *41/50*
U.S. Cl. 215—253 **4 Claims**

1. A closure having body means for securement to means defining a pouring opening through which the contents of a receptacle may be dispensed, said opening being adapted to be opened and closed by means of said closure to permit flow and to terminate flow respectively; said body means including a circular top, said closure being in one piece and comprising resilient but generally shape-retaining plastics composition, a recess in said top, said recess having a floor constituted as a readily puncturable membrane, a flexible bail of substantially semi-circular configuration integrally formed with the body means and connected by at least one end thereto, the other end of the bail carrying a sharp puncturing member so positioned that when the bail is flexed to position the point of the sharp member confronting the membrane, the member may be thrust through the membrane to present a pouring opening when the member is withdrawn; said member having an annular shoulder adapted to shear tags left around the periphery of the punched opening, the closure being further characterized by detent means to retain the bail in inoperative position thereof pending manipulation of the member.

4,153,176

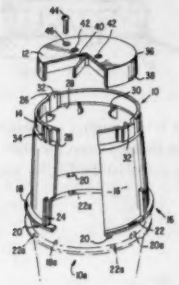
METER BOX HAVING ROTATABLE COVER AND INTERLOCKING MEANS

John R. Carson, La Verne, Calif., assignor to Carson Industries, Inc., La Verne, Calif.

Continuation of Ser. No. 660,061, Feb. 23, 1976, Pat. No. 4,065,020, which is a continuation-in-part of Ser. No. 601,047, Jul. 30, 1975, Pat. No. 3,952,908. This application Sep. 23, 1977, Ser. No. 818,949

Int. Cl.[2] B65D *25/24, 41/06*

U.S. Cl. 220—18 5 Claims



1. A meter box assembly comprising:

(a) a round meter box having an open top with an upwardly extending rim forming a ledge member and inwardly extending support means disposed adjacent said rim for supporting an associated cover, said rim having slots configured to permit said cover to pass between said slots and be disposed on said support means;

(b) a cover member having means for engaging said ledge member, said means for engaging said ledge member configured to selectively pass through said slots when in alignment therewith, said cover member being axially rotatable on said meter box between a first open position wherein said slots are in alignment with said means for engaging said ledge member, and a second closed position wherein said means for engaging said ledge member prevents removal of said cover from said box by selectively engaging said ledge member; and

(c) an opening disposed through said cover adjacent the periphery thereof, said opening configured such that locking means can be inserted therethrough when said cover is in said second position so as to prevent the substantial rotation of said cover in any direction.

4,153,177

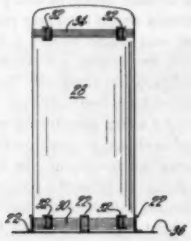
NON-CORROSIVE HOLD DOWN LUG FOR TANKS

Mark E. Greenwood, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 1, 1977, Ser. No. 829,743

Int. Cl.[2] B65D *25/20*

U.S. Cl. 220—85 R 8 Claims



4. A tank having secured thereto a non-corrosive generally L-shaped hold-down lug of resin reinforced with a plurality of reinforcing strands extending substantially parallel to each other and each generally defining an L-shape.

4,153,178

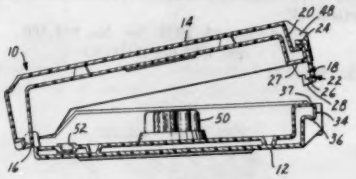
DOUBLE-ACTING LATCH FOR HINGED PLASTIC BOX

Mark W. Weavers, Little Canada, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 14, 1978, Ser. No. 896,603

Int. Cl.[2] B65D *41/16*

U.S. Cl. 220—306 9 Claims



1. In a plastic box comprising hinged container and cover parts, an improved double-acting latch comprising:

a rail of T-shaped cross-section extending along and integral with a sidewall of one of said parts,

a flexible plastic slide having flanges fitting around the shoulders of the T-shaped rail and being slidable along the rail between open and locked positions,

one shoulder of the rail and one flange of the slide being formed with notches which are aligned when the slide is at the open position,

a tab integral with the other of said parts and adapted to fit into the notch in the rail when the box is closed while the slide is at the open position and to be retained by the notched flange upon movement of the slide toward the locked position to latch the two box parts together, and

a detent integral with the slide adapted for snap-fitting engagement and disengagement with the rail when the slide is at its locked position to provide a second latching action.

4,153,179

METHOD AND APPARATUS FOR SEPARATING WIRES

Makoto Hashimoto, Kaizuka; Yoshio Tomita, Amagasaki; Fumio Nagatsuna, Kawasaki; Masateru Hirose, Takarazuka, and Shogo Tanno, Nishinomiya, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Filed Dec. 14, 1977, Ser. No. 860,489

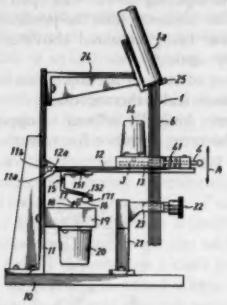
Claims priority, application Japan, Dec. 24, 1976, 51-156701

Int. Cl.[2] B65H *1/06*

U.S. Cl. 221—1 11 Claims

1. A method of separating a group of wires by pressing the group of wires against movable means having at least one notch formed in a surface thereof to force the wires into the notch one at a time, and separating the wire in the notch from the group of remaining wires and transferring the same by the movement of the movable means while confining the wire in

the notch by a confining member disposed along and close to the path of movement of the notch, the method being characterized in that the movable means and the group of wires are rocked relative to each other longitudinally of the wires.

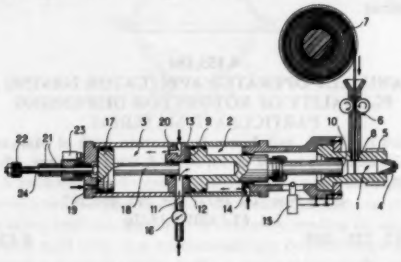


4,153,180

AUTOMATIC DEVICE FOR SUPPLYING AN INJECTION MACHINE WITH A MATERIAL SUCH AS AN ELASTOMER

Bernard Fernique, Poissy, France, assignor to Somifra (Societe d'Outillage et de Mecanique de l'Ile-de France), Claye Souilly, France

Filed Jan. 24, 1978, Ser. No. 872,328
Claims priority, application France, Jan. 27, 1977, 77 02254
Int. Cl.[2] B29F *1/06*
U.S. Cl. 222—56 **5 Claims**



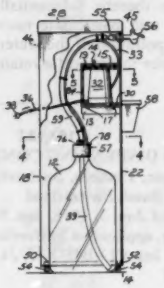
1. An automatic device for supplying an elastomer or like material for an injection machine comprising an injection cylinder and a piston, wherein the piston is controlled by a hydraulic multiplier device formed by two stages, the first stage being called the downstream stage and the second stage being called the upstream multiplier stage, each stage having a fluid supply, and wherein the device comprises means for controlling the supplying of the cylinder with material so as to stock said cylinder by means of an electrically driven tape advance unit, said control means operating when said piston is moved in the downstream direction, means for starting said upstream multiplier stage to multiply the pressure in said injection cylinder, said starting means being controlled from a pressure threshold of the fluid supply of said first downstream stage and means for actuating said first and second stages to make the piston return at the end of the injection.

4,153,181

LIQUID DISPENSER

Wallace J. Parker, and Gordon N. Nosser, both of Highland, Calif., assignors to Parker-Nosser Company, Inc., Highland, Calif.

Continuation-in-part of Ser. No. 709,648, Jul. 29, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,593
Int. Cl.[2] B67D *5/54*
U.S. Cl. 222—61 **10 Claims**



1. Means particularly suitable for dispensing water from an upright bottle on the floor, comprising:

an pneumatic diaphragm pump actuated by an AC field coil for pressurizing said bottle to a pressure level above atmospheric pressure;

means associated with said pump for filtering air compressed thereby;

a normally closed microswitch having a sensitive control button adapted to open said switch when pressed inwardly;

a pressure chamber partially enclosed by a distensible diaphragm;

electrical wiring interconnecting said pump and said microswitch and adapted to receive electrical energy from a suitable source to power the pump when the microswitch is closed;

a gas line system for connecting the pump with said bottle and said pressure chamber to permit the pump to concurrently pressurize the bottle and pressure chamber to the same pressure level when said pump is operating;

means permitting the outflow of water from said bottle including a conduit arrangement of a length designed to extend from a point below the liquid surface in said bottle upwardly out of the bottle to a predetermined height, said conduit arrangement having a liquid dispensing head at its upper end adapted to remain normally closed but which can be readily opened to permit the outflow of water from said bottle under the influence of air pressure in the bottle;

the distensible diaphragm of said pressure chamber being adapted to bulge outwardly when subjected to air pressure within the chamber, and said pressure chamber being mounted in proximity to the control button of said microswitch so that the diaphragm bulges outwardly and exerts switch opening force on said button when the air pressure within the pressure chamber reaches the above-indicated pressure level of above atmospheric pressure;

whereby electrical energization of said pump after said first-mentioned means is connected to said bottle for use causes the pump to operate and pressurize said bottle and said pressure chamber to said pressure level above atmospheric pressure whereat the diaphragm on said pressure chamber exerts force on the control button of said microswitch to open said switch and inactivate the pump, and whereby the system is maintained at said pressure level above atmospheric pressure until water is withdrawn from the bottle through said liquid dispensing head to cause lowering of the pressure within the bottle and said pres-

sure chamber, whereat said diaphragm immediately shrinks away from and ceases to exert forces on the control button of said microswitch and said pump is again energized to build up pressure within said bottle and pressure chamber until said diaphragm again bulges outwardly to exert switch opening force on said control button to cause cessation of operation of said pump; and

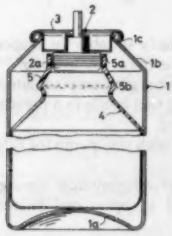
whereby the means for filtering air compressed by the pump insures the substantial removal of particulate matter from the pressurized air entering the bottle when the pump is in operation to thereby substantially prevent the entry of bacteria on said particulate matter into said bottle and consequent pollution of the water by said bacteria so that drinking water in the bottle retains its purity for drinking purposes.

4,153,182

PRESSURIZED DISPENSING CONTAINER WITH LINER

Arnold E. Loeliger, Pratteln, Switzerland, assignor to Aerosol Service, A.G., Basel, Switzerland

Filed Jun. 7, 1976, Ser. No. 693,701
Claims priority, application Switzerland, Jul. 2, 1975, 8649/75
Int. Cl.[2] B65D *25/14, 83/14*
U.S. Cl. 222—95 **14 Claims**



1. A can for dispensing a product comprising a substantially dimensionally stable pressure-tight outer container including a container body having an upper annular shoulder terminating in an edge defining an opening of a first diameter, a valve plate sealingly secured at said edge, a dispensing valve carried by said valve plate, an at least partially deformable inner container arranged within said outer container, said inner container including a container body having an upper annular shoulder terminating at a neck which in turn includes an opening in fluid communication with said valve, said neck being substantially dimensionally stable however elastically deformable in a radial direction, said neck including a portion disposed between said inner container upper annular shoulder and said inner container opening and protruding radially beyond said neck, said protruding portion having a maximum external diametrical dimension in its undeformed condition which is greater than said first diameter whereby said protruding neck portion can temporarily rest exteriorly upon said edge while filling the inner container and will radially inwardly elastically deform under the influence of an axial force to temporarily lessen said maximum diametrical dimension thus permitting said protruding neck portion to pass through said outer container opening, and said protruding neck portion being positioned totally below said outer container edge and in non-contacting relationship thereto.

4,153,183

ICE CUBE DISPENSING DEVICE

Arbery G. Chatman, 8639 Jennings Rd., 8639 Jennings Rd., Mo. 63136

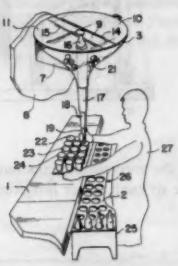
Filed Oct. 7, 1977, Ser. No. 840,289
Int. Cl.[2] B67D *5/06*
U.S. Cl. 222—185 **2 Claims**

1. An ice cube dispensing device for a bar having a serving surface and a work surface behind the serving surface and at a lower height than the serving surface, said ice cube dispensing device comprising

a funnel type container having an open top of predetermined diameter and tapering down to an open bottom of considerably smaller diameter than the predetermined diameter, said container being mounted above a bar with its axis substantially vertical;

a cross member affixed to the top of the container and extending diametrically thereacross;

a pair of covers hingedly affixed to opposite longitudinal edges of the cross member for selectively opening and closing the top;



a stop member affixed to the cross member in the container and extending coaxially toward the bottom but spaced therefrom; and

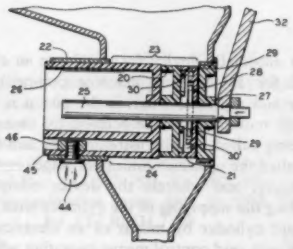
a plurality of tubular members telescopically slidably coupled to each other, one of said tubular members being slidably coupled to the container and extending through the open bottom thereof whereby in extended position the tubular members extend a maximum distance from the container and direct ice cubes stored in the container to glasses on the bar and in a withdrawn position said one of said tubular members extends into the container and abuts the stop member thereby blocking the bottom of the container and preventing ice cubes from leaving the container.

4,153,184

MANUALLY OPERATED APPLICATOR HAVING A PLURALITY OF ROTORS FOR DISPENSING PARTICULATE MATERIAL

Richard L. Parish, and James D. Amerine, both of Marysville, Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio

Filed Nov. 14, 1977, Ser. No. 851,207
Int. Cl.[2] G01F *11/10*
U.S. Cl. 222—185 **8 Claims**



1. A manually operated applicator adapted to distribute precisely controlled quantities of particulate material comprising in combination

a hopper for said particulate material having an opening at a lower extremity thereof,

an elongated discharge conduit extending below the hopper from said opening and

control means located in the upper portion of said discharge conduit for controlling the amount of particulate material discharged from said applicator, said control means comprising a plurality of rotors horizontally mounted for rotation within a cylindrical housing, said housing surrounding said rotors and having openings therein in communication with said hopper and said discharge conduit to permit particulate material to flow from the hopper through the rotor to the discharge conduit, said rotors containing cavities therein for metering the amount of particulate material flowing therethrough, said rotors being spaced from the closed portion of said housing by a small annular clearance to permit a small but controlled amount of particulate material to enter said clearance, said rotors being fixedly mounted on a shaft journaled at both ends thereof on bearings mounted within said cylindrical housing, at least one of said bearings being axially adjustable to accommodate said rotors of varying axial width and an arm fixedly mounted on said shaft for manually rotating said rotors wherein one of said rotors is fixedly mounted on said shaft and another rotor is fixedly attached to said one rotor by a snap-fit.

4,153,185

PACKAGE FOR FLUIDS AND A METHOD FOR PRODUCING SUCH A PACKAGE

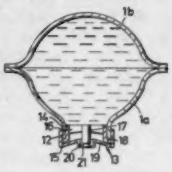
Billy N. Nilson, Mjölby, Sweden, assignor to KeNova AB, Malmo, Sweden

Filed May 5, 1976, Ser. No. 683,385

Claims priority, application Sweden, May 6, 1975, 7505295

Int. Cl.[2] B65D *35/50*

U.S. Cl. 222—212 **8 Claims**



1. A package for dispensing fluids comprising two concave walls with the concavities facing each other, at least one of said walls being resilient, the force of resiliency tending to snap the deformed wall over to a correspondingly convex shape when deformed toward the other wall beyond a substantially planar position, and one of said walls having a discharge opening with a self-closing closure, said closure opening upon a predetermined pressure of the content of the package on the closure, for dispensing said fluids, said closure substantially preventing the entry of air into said package through said opening; and means interconnecting said walls along the peripheries thereof for permitting at least the major part of the inner surface of a resilient wall to engage the concave surface of the other wall when said resilient wall is deformed by exerting a pressure thereon to such an extent that substantially the entire content of the package is dispensed, said predetermined pressure of said closure being greater than the force of the tendency of said deformed wall to snap over to said convex shape when deformed beyond the substantially planar position, said prevention of air entry and said pressure differential between said closure and said deformed wall force combining to maintain the deformed shape of said package and to allow further controlled dispensing of said fluids.

4,153,186

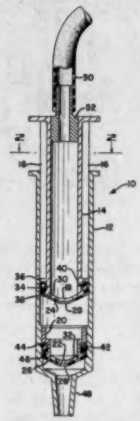
VALVE AND MEDICANT DISPENSING SYRINGE

Norman H. Nye, Cuyahoga Falls, Ohio, assignor to Arthur T. Medkeff, Tallmadge, Ohio, a part interest

Filed Jul. 20, 1977, Ser. No. 817,142

Int. Cl.[2] A61M *5/315*

U.S. Cl. 222—378 **4 Claims**



2. A dispensing syringe comprising telescopically engaged inner and outer sleeves having corresponding dispensing ends and open receiving ends, said outer sleeve having a nozzle defining an outlet at its dispensing end,

an insert cup positioned in said outer sleeve and extending across the internal diameter of said outer sleeve adjacent its dispensing end, said insert cup having a dispensing end and

a pair of corresponding flexible seal means, of the same size and shape, tightly engaging the outer surfaces of said dispensing end of said inner sleeve and of said insert cup for flow of material only towards the syringe outlet, said dispensing ends having openings therein offset from the center axis of said sleeves, said seal means having an opening therein on the center axis of the syringe and closing said openings in said dispensing ends of said insert cup and said inner sleeve normally, but opening for flow of material towards said nozzle.

4,153,187

METERING DISPENSER FOR LIQUIDS

Jack D. Marrington, Capalaba, Australia, assignor to J. D. Engineering Services Pty. Ltd., Australia

Filed May 12, 1976, Ser. No. 685,922

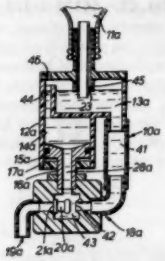
Claims priority, application Australia, May 16, 1975, PC1636; Oct. 30, 1975, PC3780; Feb. 13, 1976, PC4847

Int. Cl.[2] G01F *11/32, 11/44*

U.S. Cl. 222—440 **7 Claims**

1. A liquid dispenser comprising a metering chamber and a piston assembly selectively movable therein to vary the volume of said chamber, a supply chamber adapted for liquid communication with said metering chamber, normally open liquid supply valve means positioned intermediate said metering and supply chambers whereby the liquid in said chambers may be maintained at the same level, an outlet drain connected to said metering chamber through which liquid may be drained from said metering chamber, said supply chamber being adapted to cooperate with an inverted bottle such that the level of liquid within said supply chamber is at the lower open end of said bottle, a hollow piston rod connected to said piston assembly providing a flow passage therefrom communicating with the interior of said metering chamber and comprising said outlet drain, normally closed outlet valve means for control-

ling the flow of liquid through said outlet drain, and control means interconnecting said liquid supply valve means and said outlet valve means for cyclic operation wherein said liquid supply valve is closed and said outlet valve means is opened to



dispense the liquid from said metering chamber, and subsequent thereto to close said outlet supply valve and reopen said liquid supply valve for replenishing said metering chamber with liquid from said supply chamber.

4,153,188

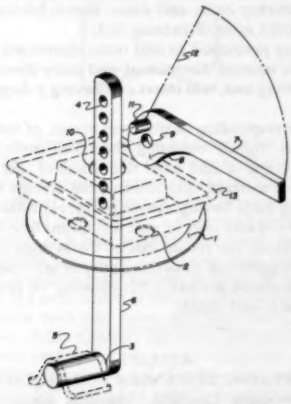
TIRE HOLD-DOWN DEVICE

Claude W. Seymour, 8401 Delido Rd., Louisville, Ky. 40219

Filed Feb. 28, 1977, Ser. No. 759,997

Int. Cl.[2] B62D *43/10*

U.S. Cl. 224—42.24 **2 Claims**



1. A hold-down arrangement to secure an automotive wheel to a fixed support including:

a. plate means having cooperative aperture therein and adapted to engage a portion of said wheel;

b. cooperative eye means carried by said support;

c. elongate post means having at least two transverse opening means provided in said post means and wherein said opening means are located in spaced relation along a portion of the length of said post adjacent a first end of the post means where said post means is adapted to be received through said aperture means of said plate means;

d. bracket means extending laterally from a second end of said post means to be releasably received by said eye means;

e. cooperative cam means carried by cooperative handle means with detent means extending laterally from said cam means and cooperatively secured to said cam means where said detent means is adapted to be received in selected opening means of said post means to provide pivot means about which said cam means can be pivoted and rotated to engage said plate means to urge said plate means against said wheel to secure wheel to fixed position relative to said support.

f. said cam means being provided with a cooperative aperture means located so that when said cam means is pivoted and rotated to urge said plate means against said wheel to secure said wheel to a fixed position relative to said support, said cooperative aperture means is aligned with a transverse opening means of the post means.

4,153,189

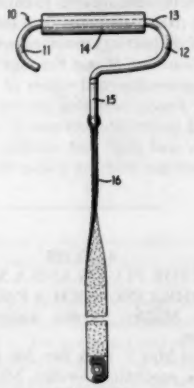
CARRIER FOR CLOTHES HANGERS

Allan F. Hughes, 1356 Bay Terr., North Bay Village, Fla. 33141

Filed Jan. 3, 1978, Ser. No. 866,412

Int. Cl.[2] B65D *71/00*

U.S. Cl. 224—45 T **1 Claim**



1. A carrier for clothing on hangers comprising a C-shaped gripping bar having an elongated and substantially straight portion, a rotatable handle on the straight portion of the gripping bar, a closed loop on one end of the C-shaped bar formed by bending the end of the bar and lying in a plane perpendicular to the plane of the C-shaped bar, the loop adapted to receive hanger hooks, a flexible strap attached to the loop for wrapping around the loop and hangers to secure the hanger hooks to the loop, the flexible strap including hooking elements made of flexible resilient material on one face and holding elements for the hooking elements comprising loops of flexible material on the other face so that when the two faces are pressed together they will adhere to each other to assist in securing the hanger hooks to the loop, a hook formed in the C-shaped bar at its other end and adapted to be placed on supporting bars or hooks, whereby the gripping bar may readily be grasped for carrying clothing supported by the hangers.

4,153,190

MAGNETIC FEEDING DEVICE

Thomas E. Marion, Baltimore, Md., assignor to Universal Machine Co., Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 770,280, Feb. 18, 1977, which is a continuation of Ser. No. 624,070, Oct. 20, 1975, abandoned. This application Nov. 30, 1977, Ser. No. 856,017

Int. Cl.[2] B65H *23/18, 17/22, 17/36*

U.S. Cl. 226—33 **26 Claims**

1. Web feeding means for advancing a web of material in successive predetermined increments from a supply of said web material comprising:

guide means receiving said web material from a supply thereof and supporting same over a predetermined length thereof;

intermittent drive means mounted adjacent said guide means and intermittently engaging said web means to advance

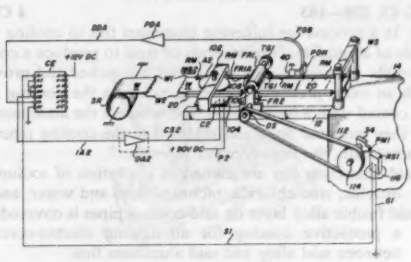
same relative to said guide means at predetermined regular intervals;

control means responsive to a predetermined incremental advance of said web for generating a control signal; and

magnetic brake means adjacent said web, upstream from said intermittent drive means, responsive to said control signal for engaging said web to preclude further advance thereof;

said intermittent drive means comprising:

a reciprocating carriage having advanced and retracted positions along said guide means; and



second magnetic brake means mounted on said carriage for reciprocation therewith along said guide means in close proximity with said web; and

wherein said control means includes:

first detector means sensing said retracted position of said carriage and generating a command signal in response thereto; and

circuit means responsive to said command signal to actuate said second magnetic brake means and deactuate said first magnetic brake means.

4,153,191

FEEDERS FOR WEB MATERIAL

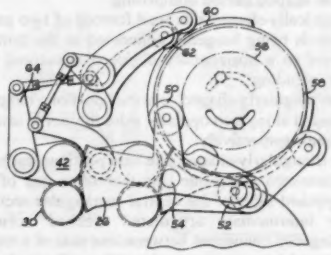
Thomas D. Bishop, Birmingham, England, assignor to The Deritend Engineering Company Limited, Birmingham, England

Filed May 25, 1977, Ser. No. 800,317

Claims priority, application United Kingdom, May 28, 1976, 22281/76

Int. Cl.[2] B65H *17/22*

U.S. Cl. 226—143 **2 Claims**



1. Treatment apparatus comprising a pair of treatment rolls arranged to operate on web material during a portion of each revolution of at least one of said rolls, a cam shaft carrying one of the rolls and a plurality of cam tracks, two pairs of feed rolls driven from the same cam shaft and arranged to drive the web in opposite directions, and independently adjustable variable drive transmission means so connected to the feed rolls that a synchronised area of web is delivered to the treatment rolls at the speed of the treatment rolls in each cycle of the treatment rolls, the respective transmission means for each of the pairs of feed rolls including a pivotally mounted sector for driving one of the feed rolls of the respective pair of feed rolls, a pair of cam followers carried by the sector and engaging different ones of two of said cam tracks, a pivotally mounted crank connected to lift off and drop down the other one of the feed rolls of the respective pair of feed rolls, and cam follower means driven by a third of said cam tracks for operating the crank.

4,153,192

CONTROL MEMBER FOR FASTENING ELEMENT SETTING DEVICE

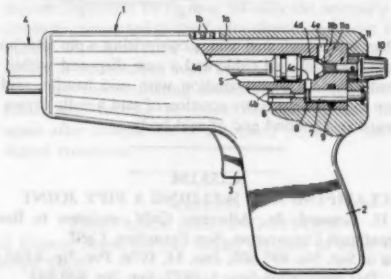
Peter Jochum, Meiningen, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 21, 1978, Ser. No. 879,618

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2709065

Int. Cl.[2] B25C *1/14*

U.S. Cl. 227—10 **15 Claims**



1. An explosive powder operated setting device for driving fastening elements such as bolts, studs and the like, into a hard receiving material, comprising a barrel having an axially extending bore from which a fastening element can be driven into the receiving material, a firing chamber located within said barrel and arranged for supplying explosive gases into the bore, at least one exhaust duct in said barrel and arranged to receive explosive gases from said bore for diverting the gases from use in setting a fastening element, a movably positionable control member located in said barrel and in the path of flow of the explosive gases between said firing chamber and said exhaust duct for regulating the flow of explosive gases to said exhaust duct, wherein the improvement comprises that said control member comprises a conical member with the conical surface thereof converging in the direction in which the force of the explosive gases is applied to said control member, and said bore forming a conical seating surface having a complementary shape to the shape of the conical surface of said conical member with the conical surface of said conical member seated in contacting engagement with said seating surface, and said conical member arranged to be displaced in sliding contact with said seating surface for selectively varying the flow of explosive gases to said exhaust duct.

4,153,193

POLE EXTENSION FOR POWDER-ACTUATED TOOL

Edward J. Urbanowicz, Oxford, Conn., assignor to Olin Corporation, New Haven, Conn.

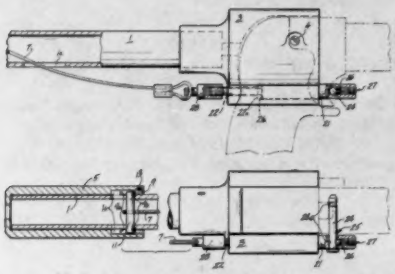
Filed Apr. 26, 1978, Ser. No. 899,920

Int. Cl.[2] B25C *1/18*

U.S. Cl. 227—156 **5 Claims**

1. An extension device for use with a powder-actuated tool including a firing mechanism, said device comprising a hollow, elongate body, gripping means disposed at a first end of said body and adapted to releasably grip a powder-actuated tool in a manner permitting discharge thereof, a handle telescopingly carried on the second end of said body and adapted for rotation about the longitudinal axis thereof, a flexible, inelastic cable

disposed substantially within said body and adapted for engagement, at a first end, with the tool firing mechanism, and means operably connecting said handle and the second end of said cable member whereby rotation of said handle relative to said body will result in actuation of the tool firing mechanism



to discharge the tool, said means comprising a pin attached to said second end of said cable and a cam disposed within said body and adapted for co-rotation with said handle, said pin riding on said cam whereby rotation of said handle draws said pin toward said second end of said body.

4,153,194

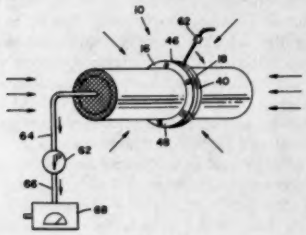
CLAMPING AND WELDING A PIPE JOINT

Byron H. Leonard, Jr., Atherton, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Division of Ser. No. 695,605, Jun. 14, 1976, Pat. No. 4,065,846. This application Sep. 1, 1977, Ser. No. 829,844

Int. Cl.[2] B23K *37/02, 37/04*

U.S. Cl. 228—29 **1 Claim**



1. Apparatus for assembling a pipe joint having first and second segments with male skirts extending outwardly around the peripheries of said segments to be joined, said skirts when abutted mutually defining an annular mated ridge adjacent confronting portions of the skirt peripheries for receiving a seal weld, and a collet for being fastened over said abutted skirts and said seal weld to axially compress said pipe segments at said skirts to provide the mechanical strength to said pipe joint, said apparatus for assembling said pipe joint comprising: means for applying a vacuum interior of said pipe joint wherein said abutted skirts are drawn into intimate contact; means for detecting vacuum leaks interior of said pipe joint during application of said vacuum; jig means operable to carry a welding head; vehicle means operable to carry said jig means and to transport said jig means around the periphery of said pipe joint; and track means operable to guide said vehicle means in a circular path about the periphery of said pipe joint for placement of said seal weld on said mated ridge by said welding head while said means for applying a vacuum maintains said skirts in axial compression; said jig means being further operable to carry a cutting head for removal of said seal weld to disassemble said pipe joint; said means for detecting vacuum leaks providing a test of said seal weld substantially immediately after placement thereof.

4,153,195

PROCESS FOR THE ATTENUATION OF ELECTRO-CORROSION IN COOLER ASSEMBLIES SOLDERED BY THERMAL BATH IMMERSION

Dan A. Barozzi; Valentin Călin, both of Brasov, and Zsigmond Peter, Prejmer, all of Romania, assignors to Intreprinderea de Radiatoare Si Cabluri Brasov, Brasov, Romania

Continuation-in-part of Ser. No. 771,000, Feb. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 612,806, Sep. 12, 1975, abandoned. This application Jun. 23, 1978, Ser. No. 918,398

Int. Cl.[2] B23K *1/20*

U.S. Cl. 228—183 **4 Claims**

1. In a process for soldering aluminum fins to cooling pipes made of aluminum, copper, brass or steel to produce a cooling assembly wherein the aluminum fins are etched and provided with an oxide-preventing coating, wherein the cooling pipes are coated with a fusible alloy, and wherein the aluminum fins are then mounted upon and soldered to the cooling pipes in a thermal bath, the improvement wherein:

said aluminum fins are etched in a solution of sodium hydroxide, zinc chloride, technical urea and water; and

said fusible alloy layer on said cooling pipes is covered with a protective coating for attenuating electro-corrosion between said alloy and said aluminum fins.

4,153,196

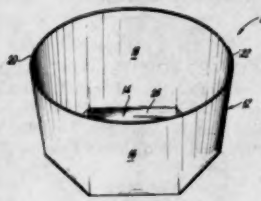
TUB-SHAPED CARTON AND BLANK FOR FORMING SAME

Daniel P. Dutcher, Woodbury, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 1, 1977, Ser. No. 829,720

Int. Cl.[2] B65D *3/04, 5/24*

U.S. Cl. 229—1.5 B **15 Claims**



1. A tub shaped carton comprising:

a cylindrically-shaped side wall formed of two panels;

said panels being hingedly connected at the bottom edges thereof to a horizontally disposed hexagonal base, said base including:

a rectangularly-shaped central portion hingedly connected along two opposite sides thereof to said two wall panels respectively;

two triangularly-shaped side base portions, each integrally connected along one side thereof to one of the other opposed sides of the central rectangular section; and

four intermediate articulated webbed corners, each hingedly connected between one side of a triangularly-shaped base portion and a side wall panel, with each said articulated webbed corner being disposed wholly within said tub shaped carton so as to provide a reinforced flat bottom base for said tub-shaped carton.

4,153,197

COIN BANK

A. Douglass Hall, David's Hill Rd., Bedford Hills, N.Y. 10507

Filed Sep. 12, 1977, Ser. No. 832,459

Int. Cl.[2] A47G *29/00*

U.S. Cl. 232—5 **9 Claims**

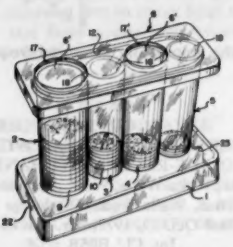
1. An improved coin bank comprising:

(a) a base;

(b) standard creased tubular coin wrappers for the particular denomination of coins to be received therein said wrappers each having one end thereof cut at an angle to the longitudinal axis thereof with the tip of the cut edge located at the crease;

(c) a plurality of generally tubular members upstanding from one side of the base with each tubular member having,

(1) an inner wall defining a predetermined cross-sectional area configured to receive coins having a preselected lesser cross-sectional area, and



(2) an effective height equal to the height of a stacked plurality of coins sufficient to fill a standard coin wrapper suited for the particular denomination of coins to be received therein; and

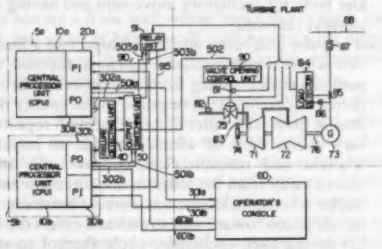
(d) a clearance space defined by the inner wall of the tubular member and the circumference of the stack of coins stored therein, said clearance space having a width sufficient to permit the insertion of the cut end of the wrapper into the tube and around the stack of coins.

4,153,198

ELECTRO-HYDRAULIC GOVERNOR EMPLOYING DUPLEX DIGITAL CONTROLLER SYSTEM

Yurio Eki; Yasuhiro Tennichi, and Naganobu Honda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 1, 1977, Ser. No. 764,647
Claims priority, application Japan, Feb. 4, 1976, 51-10385
Int. Cl.[2] G06F *15/46, 11/00*
U.S. Cl. 235—303.3 **26 Claims**



1. An electro-hydraulic governor including a turbine operated by a fluid supplied through an input valve, two digital computers disposed independently of each other each for receiving inputs representing the operating conditions of said turbine together with inputs representing the settings provided by the operator and processing said inputs according to a preset program and thereby producing an output representing the result of processing, discriminating means for discriminating between normal operation and abnormal operation of said two digital computers in accordance with the contents of processing of said two digital computers, and output switching means responsive to an instruction signal applied from said discriminating means for applying the output of one of said digital computers as a signal for controlling said input valve;

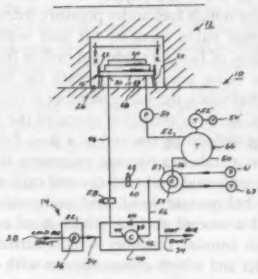
the improvement wherein each of said digital computers includes input means for receiving inputs representing the operating conditions of said turbine together with inputs representing the settings provided by the operator, processing means for processing the inputs received by said input means according to a preset program and output means for producing an output representing the result of processing by said processing means; said input means, said output means and said processing means of one of said digital computers being operated respectively independently from said input means, said output means and said processing means of the other of said digital computers; and each of said digital computers being supplied with the inputs representing the operating conditions of said turbine through a set of normally closed contacts, and additional means to deal with failure occurring in one of said digital computers by turning off only the normally closed contacts connected to the faulty digital computer to completely disconnect the faulty computer from all of its inputs in accordance with the instruction signal applied from said discriminating means via the output switching means and turning on these normally closed contacts again after completion of necessary repair on said faulty digital computer.

4,153,199

FIREPLACE HEATING SYSTEM

David Ellmer, South Haven, Mich., assignor to John Hoover, Covert, Mich.

Filed Feb. 10, 1977, Ser. No. 767,497
Int. Cl.[2] F24B *9/04*
U.S. Cl. 236—9 A **4 Claims**



1. A heating system adapted to be installed in an open fireplace for supplementing the heat generated by a conventional forced hot air heat system, said heating system comprising:

a conventional forced hot air heat system having a hot air duct;

a grate having a log supporting base, said base comprising a water carrying conduit following a tortuous path in which water is heated by the burning logs supported by said base, said water carrying conduit having an inlet through which water is introduced and an outlet through which hot water is exhausted;

a hot water storage tank communicating with said base inlet;

a heat exchanger mounted in said hot air duct of said conventional forced hot air heat system, said heat exchanger having an inlet connected to said grate outlet and an outlet connected to said storage tank;

pump means for pumping said water from said storage tank through said grate base and to said heat exchanger; and

temperature sensing means in said duct, said temperature sensing means responsive to a predetermined temperature within said air duct for actuating said pumping means.

4,153,200

FUEL INJECTION NOZZLES

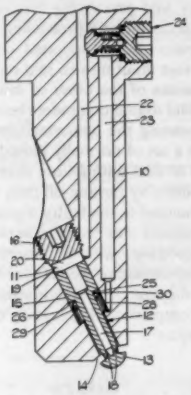
Ivor Fenne, Greenford, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 10, 1977, Ser. No. 850,451

Claims priority, application United Kingdom, Nov. 12, 1976, 47188/76

Int. Cl.² F16K *17/04*

U.S. Cl. 239—94 **6 Claims**



1. A fuel injection nozzle for supplying fuel to a combustion chamber of an internal combustion engine, comprising a poppet valve member having a head which is adapted to co-operate with a seating to control the flow of fuel through a spray orifice from an inlet, said poppet valve member having a first surface against which fuel under pressure from said inlet acts to lift said poppet valve member off said seating and thereby permit the flow of fuel through said orifice from said inlet, the spray orifice being positioned beneath the head of the valve member so that when the valve member is closed, the orifice is closed off from the combustion space of the engine, said first surface being defined by the end of a stem forming part of the poppet valve member, a passage extending through said stem and opening onto said first surface, said orifice being provided in the stem below said head, and communicating with said passage, and a second surface which is of annular form and faces into an annular chamber which surrounds the poppet valve member and which communicates with said inlet by way of a non-return valve, the pressure acting on said surface acting to oppose the lifting of the head from the seat.

4,153,201

TRANSDUCER ASSEMBLY, ULTRASONIC ATOMIZER AND FUEL BURNER

Harvey L. Berger, Poughkeepsie, and Charles R. Brandow, Highland, both of N.Y., assignors to Sono-Tek Corporation, Poughkeepsie, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,812

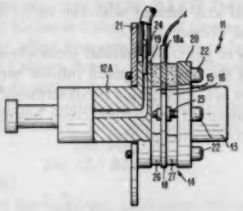
Int. Cl.² H04F *17/00*

U.S. Cl. 239—102 **13 Claims**

1. A transducer assembly comprising:

a first section in the form of a symmetrical double-dummy ultrasonic horn having a driving element sandwiched therein, said first section having an empirically measured characteristic resonant frequency and

a second section including an amplification step, wherein the theoretical resonant frequency of the second section



matches the empirically measured frequency of the first section.

4,153,202

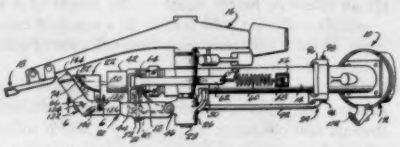
PART-CIRCLE SPRINKLER HEAD WITH IMPROVED QUICK-RETURN MECHANISM

Larry P. Meyer, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Oct. 19, 1977, Ser. No. 843,734

Int. Cl.² B05B *3/08*

U.S. Cl. 239—230 **41 Claims**



1. A part-circle sprinkler head comprising a sprinkler body having an inlet and an outlet,

means for mounting said sprinkler body for controlled rotational movement about a generally vertical axis with said inlet in communication with a conduit arranged to communicate a source of water under pressure therewith,

said outlet being disposed to direct water under pressure communicated with said outlet in a stream flowing therefrom in a direction upwardly and outwardly in generally symmetrical relation to a plane passing through the axis of rotation,

an impulse arm pivotally mounted with respect to said sprinkler body for oscillatory movement and having a reactant element thereon,

said impulse arm being normally biased into a limiting position wherein said reactant element is disposed within the path of a stream issuing from said outlet and having means thereon operable (1) in response to the energy of a stream issuing from said outlet to move through repeated oscillatory cycles each of which includes an impulse stroke wherein said reactant element leaves the stream and moves away from the latter in one direction and a return stroke wherein said reactant element moves in the opposite direction toward said stream and enters the latter, and (2) during each oscillatory cycle thereof to effect controlled incremental rotational movement of said sprinkler body in one direction,

a reversing arm mounted with respect to said sprinkler body for movement between operative and inoperative positions,

reversing reactant surface means on said reversing arm engageable by a stream issuing from said outlet when said reversing arm is disposed in said operative position for establishing (1) a resultant body reversing force component acting through said reversing arm on said sprinkler body in a direction tangential to the rotational axis of said sprinkler body for effecting a reversing rotational movement in the opposite direction and (2) a resultant reversing arm moving force component acting on said reversing

arm in a direction to move the same toward and into said operative position, and

means (1) operable in response to the movement of said sprinkler body through a first predetermined incremental range of movement in said one direction for enabling said reversing arm to move from said inoperative position into said operative position and (2) operable in response to the movement of said sprinkler body through a second predetermined incremental range of movement in said opposite direction for (A) materially reducing the aforesaid resultant arm moving force component acting on said reversing arm while the latter is in said operative position and (B) enabling said reversing arm to move from said operative position after said force component reduction and into said inoperative position.

4,153,203

TRIGGER TYPE SPRAYER

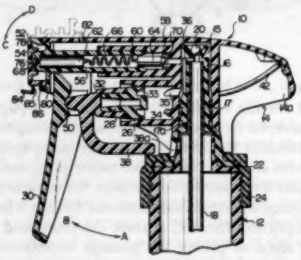
Tetsuya Tada, 6-3, 2-chome, Kakinokizaka, Meguro-ku, Tokyo, Japan

Filed Oct. 12, 1977, Ser. No. 841,572

Claims priority, application Japan, Mar. 2, 1977, 52-22437; Mar. 30, 1977, 52-38952[U]; May 24, 1977, 52-66706; Jun. 28, 1977, 52-85695[U]

Int. Cl.[2] **B05B** *11/02*

U.S. Cl. 239—333 **20 Claims**



1. A trigger type sprayer which comprises a sprayer body provided with a cylinder through which a piston slides, and engaged with a liquid container, with a pair of mutually facing engagement grooves in the inside of the lateral walls of the sprayer body;

a trigger having a front wall whose upper end portion has a notch, and a pair of lateral walls each having a lug formed on the outside of the upper end portion for engagement with the engagement groove of the sprayer body;

a nozzle which is received in a passageway through which a pressurized liquid flows from the cylinder, said nozzle being fixed to the sprayer body and extending through the notch of the front wall of the trigger, said nozzle having an ejection hole at one end thereof and being provided on the outside with a pair of integrally formed stoppers extending lengthwise of the nozzle to prevent the upper end portions of the lateral walls of the trigger from being thrown inward; and

spring means coupled to the trigger for urging the trigger outward.

4,153,204

AERATOR WITH METAL CASING HAVING INNER PLASTIC ELEMENTS MOLDABLE IN ONE PIECE

Elie P. Aghnides, 795 Fifth Ave., New York, N.Y. 10021

Continuation-in-part of Ser. No. 603,228, Aug. 8, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,491

Int. Cl.[2] **E03C** *1/084*

U.S. Cl. 239—428.5 **27 Claims**

1. An aerator comprising

a casing having threads at its upstream end for attaching the aerator to a faucet,

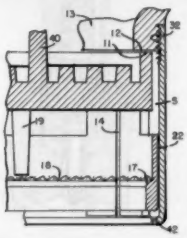
said casing being cylindrical in shape and having an inturned ledge at its downstream end,

a generally cylindrical one-piece plastic insert in said casing having a maximum outside diameter slightly smaller than the inside diameter of said casing,

said one-piece insert having an upstream cylindrical portion which engages the faucet when the aerator is screwed onto the faucet,

said upstream cylindrical portion including a perforated diaphragm across the path of flow to produce at least one high speed water jet directed in a downstream direction,

said one-piece insert also comprising a plurality of spaced ribs that have downstream ends resting on said ledge and the upstream portions of said ribs being integral with said upstream cylindrical portion of said insert, thereby enabling the plastic insert to be compressed between the downstream end of the faucet and said ledge when the aerator is screwed onto a faucet,



said one-piece plastic insert also having a plastic downstream cylindrical sleeve which is integral with the remainder of the insert and extends inside of said ribs and therefore spaced from the inner wall of the casing and also having its upstream end spaced downstreamwardly of said upstream cylindrical portion to thereby define an air path from the downstream end of the casing, through the spaces between said ribs and between the inner side wall of the casing and the outer side wall of the downstream cylindrical sleeve and then over the upstream end of the downstream cylindrical sleeve, and

mixing means located in the downstream cylindrical sleeve, said downstream cylindrical sleeve having at least one slit extending upstreamwardly from its downstream end for a substantial distance.

4,153,205

SHORT SEAT FUEL INJECTION NOZZLE VALVE

Walter A. Parrish, Jr., Hazel Crest, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

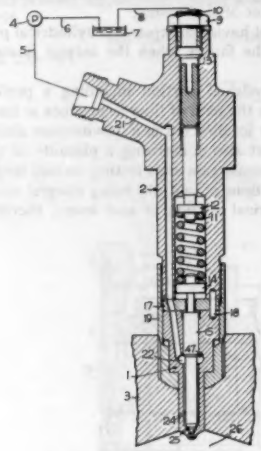
Filed Oct. 19, 1977, Ser. No. 843,450

Int. Cl.[2] **F02M** *61/04;* **B05B** *1/30*

U.S. Cl. 239—533.9 **10 Claims**

1. A differential valve assembly in the fuel injection nozzle assembly for an internal combustion engine comprising, valve elements including a valve body and a valve defining said differential valve assembly, resilient means normally biasing said valve to a closed position with said valve body and opening in response to the force of pressurized fluid in said valve assembly opposing the biasing force of said resilient means, a nozzle defining orifices downstream from said valve, one of said valve elements including intersecting conical surfaces defining an adjoining line forming a valve seat seal when engaging the other of said elements when said valve is closed, said valve body and said valve defining a differential angle valve of a larger included angle between the conical surface of the valve body and the conical surface of the valve above said valve seat seal than the included angle between said valve body and said valve defined by the conical surface of said

valve body and the conical surface of said valve downstream from said valve seat seal, the smaller included angle between said valve body and said valve downstream from said valve seat seal thereby causing the valve seat seal to migrate downstream from the initial valve seat seal due to wear of said valve



body and said valve, means defining an annular groove on a conical surface downstream from the valve seat seal defining an upper edge for limiting the downward migration of said valve seat seal due to wear of said valve, and a lower edge as large as the nozzle passage downstream from said differential valve to retain throttling.

4,153,206

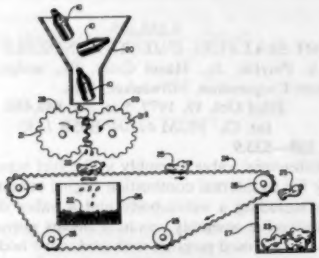
CRUSHING PROCESS FOR RECYCLABLE PLASTIC CONTAINERS

Albert J. Haefner, and Michael E. Kucsma, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 569,472, Apr. 18, 1975, abandoned, which is a division of Ser. No. 467,144, May 6, 1974, Pat. No. 3,940,001, which is a continuation-in-part of Ser. No. 295,515, Oct. 6, 1972, abandoned. This application Mar. 31, 1977, Ser. No. 783,484

Int. Cl.[2] B02C *19/14*

U.S. Cl. 241—14 **7 Claims**



1. A process for separating and recovering the laminae of a rigid, narrow-necked plastic bottle having laminated walls, the laminated walls including a fluid-barrier lamina of a flexible non-frangible material which is highly impermeable to fluids, and a load-bearing lamina of a frangible plastic material which will delaminate from said fluid-barrier lamina when said bottle is crushed, said process comprising:

(a) crushing said plastic bottle to separate said flexible, non-frangible, fluid-barrier lamina from said frangible load-bearing lamina to break said load-bearing lamina into chips, and

(b) separating said chips from said non-frangible fluid-barrier lamina.

4,153,207

PLANT FOR THE CONTINUOUS PRODUCTION OF PAPER-PULP FROM SOLID URBAN WASTE

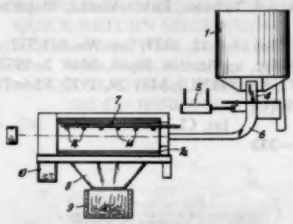
Manlio Cerroni, Via Bruxelles 53, Rome, Italy

Continuation-in-part of Ser. No. 624,896, Oct. 22, 1975, abandoned, which is a continuation of Ser. No. 463,768, Apr. 24, 1974, abandoned, which is a division of Ser. No. 358,516, May 9, 1973, Pat. No. 3,891,105. This application Jun. 30, 1977, Ser. No. 811,706

Claims priority, application Italy, Feb. 22, 1973, 48411 A/73; Apr. 20, 1973, 49595 A/73

Int. Cl.[2] B02C *23/36*

U.S. Cl. 241—46.17 **2 Claims**



1. Plant for the continuous production of paper-pulp from paper recovered from solid urban waste comprising a hydrodynamic kneader for converting paper into paper-pulp, a sorting apparatus arranged to receive paper-pulp and other materials from said hydrodynamic kneader for separating the paper-pulp and other materials, said kneader having a first opening in the lower portion thereof, a grate covering said first opening and being sized to permit the passage therethrough of paper-pulp fibers to said first opening, said kneader having a second opening extending through said grate spaced from said first opening and being open in the surface of the grate to the space contiguous to said grate within said kneader, a pump located exteriorly of said kneader, a first pipeline connecting the first opening to said pump, a second pipeline connecting the second opening to said sorting apparatus, means for collecting the paper-pulp and other materials from said sorting apparatus, said grate in said kneader being arranged for the passage therethrough of paper-pulp and other materials having a size equal to or smaller than the paper-pulp and for retaining materials of a larger size incapable of passing therethrough, said first pipeline connected to said pump for withdrawing a flow of paper-pulp and other materials of a size sufficiently small to pass through said grate from said kneader, a selectively operable valve positioned in said second pipeline for periodically withdrawing paper-pulp and materials incapable of passing through said grate from said kneader and conveying the paper-pulp and materials to said sorting apparatus, said valve including a frame and a blade-like member having a knife-like cutting edge, said blade-like member rectilinearly movably displaceable within said frame transversely across the path of flow in said second pipeline between an open position and a closed position with said cutting edge leading as said blade-like member is moved into the closed position for effecting a cutting action on the material flowing therethrough and for closing off the flow through said second pipeline, said sorting apparatus including a separator having a first end and a second end with said first end connected to said second pipeline, a screen within said separator sized to pass paper-pulp therethrough separated from the material received through said second pipeline, a channel positioned at the second end of said separator to receive oversized material passing through said separator from which the

paper-pulp has been separated, and a collector arranged to receive the paper-pulp after its passage through said screen and out of said separator from which it can be removed for subsequent treatment and use.

4,153,208

MINCING MACHINE FOR GRINDING UP FOOD

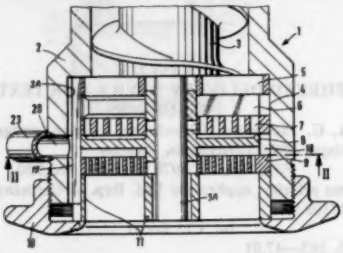
Paul Vomhof, Laasphe; Adam Reiss, Breidenstein, and Karl-Heinz Schmidt, Steffenberg, all of Fed. Rep. of Germany, assignors to Kraemer & Grebe GmbH & Co. KG, Lahn, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,599

Claims priority, application Fed. Rep. of Germany, Dec., 1976, 2656991

Int. Cl.[2] A47J *43/07*

U.S. Cl. 241—82.4 **6 Claims**



1. In a mincing machine for grinding up of food, in particular meat, cheese, fat, comprising a housing, a driven conveyor screw in said housing for supplying the food to a set of cutters which consists of at least one rotating knife and at least one perforated disk, wherein the improvement comprises said knife consisting of a hub and at least two radially extending cutting blades, which are connected by a peripheral ring, each cutting blade having a channel formed therein for discharging hard particles, which channel has an outlet opening at the outside of the ring and an inlet opening adjacent said hub of the knife, the outer surface of the ring being spaced from the inner wall of the housing to form a ring channel, a discharge opening for said ring channel in said housing, and a block member in said ring channel adjacent said discharge opening.

4,153,209

GRINDERS

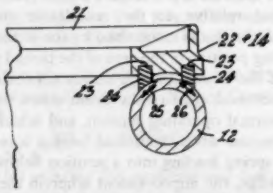
Donald S. Fraser, Randburg, South Africa, assignor to Babcock and Wilcox of Africa, South Africa

Filed Sep. 1, 1977, Ser. No. 829,657

Claims priority, application South Africa, Sep. 22, 1976, 76/5692

Int. Cl.[2] B02C *15/00*

U.S. Cl. 241—103 **1 Claim**



1. A grinder for material wherein a series of balls is entrained for rotational movement between an upper ring and a lower ring, the rings being relatively rotatable about a central axis and the balls being rotatable between the rings, material for grinding being fed into a zone between the balls and rings where grinding is effected, comprising the upper closed ring including two radially spaced replaceable annular lips separately mounted in slots in the upper ring, said annular lips engaging the balls, the contact zone between said annular lips and each ball being substantially less than the contact zone between the lower ring and each ball, said replaceable annular lips being symmetrically disposed about the pitch circle of the balls; said annular lips being spaced apart such that the angle subtended between them from the ball center is substantially 90°, said annular lips being made of a hardened steel, the upper ring comprising a spider through which material to be ground is centrally fed in an area spaced radially inwardly of said annular lips, the upper ring including said radially spaced replaceable annular lips separately mounted in radially spaced annular slots in the upper ring, and the upper ring is defined as part of said locating spider.

4,153,210

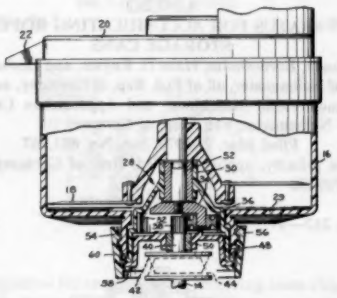
FOOD PROCESSING APPLIANCE

Robert L. Schaeffer, LeRoy, N.Y., assignor to General Electric Company, New York, N.Y.

Continuation of Ser. No. 751,042, Dec. 16, 1976, abandoned. This application Feb. 10, 1978, Ser. No. 876,764

Int. Cl.[2] B02C *18/12*

U.S. Cl. 241—282.1 **5 Claims**



1. A food processing appliance including a power unit in a power base and a removable bowl with a cutting mechanism therein supported on and driven by said power unit in said base through a speed changing transmission, the improvement comprising:

said bowl including an opening in the bottom wall thereof,

said speed changing transmission being removable and comprising a support base and including a spindle disposed through said support base for mounting a cutting mechanism thereon, said removable speed changing transmission further extending through said opening and into said bowl, and

means for forming a seal between said support base of said speed changing transmission and said bowl whereby the support base of said speed changing transmission completes and closes the bottom wall of said bowl.

4,153,211
BOBBIN ELEVATORS IN BOBBIN TRANSPORT DEVICES

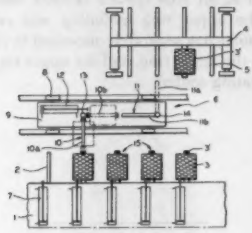
Erich Lenk; Manfred Mayer, and Gerd Münnekehoff, all of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Apr. 8, 1977, Ser. No. 785,854

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616852

Int. Cl.² B65H *54/20, 67/06*

U.S. Cl. 242—35.5 A **18 Claims**



1. Bobbin transport apparatus comprising a first, pivotable bobbin-receiving member, means for pivoting said member about a first axis between a first position in which it is aligned with a wound bobbin on a winding machine and a second position, a second, pivotable bobbin-receiving member, means for pivoting said second member about a second axis between a first position in which it is aligned with said first member in its second position and a second position of said second member in which said wound bobbin, after its transfer from said first member to said second member, may be doffed from said second member, and transfer means for shifting said wound bobbin from said first member, while in its second position, to said second member, while in its first position.

4,153,212
APPARATUS FOR ACCUMULATING ROPES IN STORAGE CANS

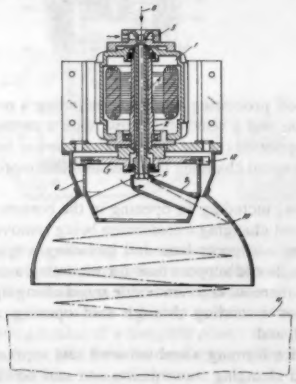
Ernst Bauch, Bordesholm; Hans D. Kayser, and Herbert Peters, both of Neümunster, all of Fed. Rep. of Germany, assignors to Neümunstersche Maschinen- und Apparatebau Gesellschaft mbH, Neümunster, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,567

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709252

Int. Cl.² B65H *54/76*

U.S. Cl. 242—47 **14 Claims**



1. An apparatus for accumulating ropes and similar elongated flexible objects in storage cans, comprising means for confining a respective object for a longitudinal advancement, including a stationary upstream guide tube having an upright axis and a rotatable downstream guide tube having an inlet end coaxial with said upstream guide tube and a discharging end at a distance from said upright axis, wherein said downstream guide tube has a flow-through cross-sectional area exceeding that of said upstream guide tube, and wherein said guide tubes communicate with each other at a merger region, said merger region configurated as an overlap; means for advancing the object through said guide tubes; means for rotating said downstream guide tube about said upright axis; and a stationary braking drum coaxial with said upstream guide tube and having an internal contact surface of arcuate configuration and with which the object comes into contact upon discharge out of said discharging end of said downstream guide tube.

4,153,213
THREAD-DELIVERY DEVICE FOR TEXTILE MACHINES

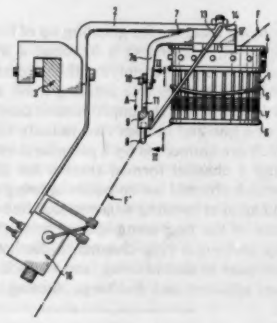
Kurt A. G. Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Mar. 6, 1978, Ser. No. 883,930

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710821

Int. Cl.² B65H *51/20*

U.S. Cl. 242—47.01 **15 Claims**



1. In a thread-delivery device for textile machines, comprising a drum which can be driven for rotation, onto which drum can be tangentially wound a thread coming from a thread bobbin for forming an intermediate thread storage, and from which for positive delivery the thread can be removed tangentially in the area of a removal edge of the drum through a thread-guiding means which is arranged approximately at the level of the removal edge radially outside of the drum, and a thread-control element is provided which is transversely movably supported relative to the withdrawn thread, which thread-control element is maintained by the withdrawn thread in one operating position in the area of the thread path between the drum and the thread-guiding means approximately at the level of the removal edge of the drum when the withdrawn thread is at normal operating tension, and which thread-control element moves when the thread tension is reduced due to its weight or spring loading into a position below the plane of the removal edge, the improvement wherein the thread-guiding means is selectively engageable with the withdrawn thread in a first position at the level of the removal edge and in a second position below the level of the removal edge, and means for holding the thread-control element in a position spaced from the thread path when the withdrawn thread engages the thread-guiding means at said second position.

4,153,214

DEVICE FOR CONTROLLING THE TENSION IN THE YARN UNWINDING FROM A YARN CARRYING BODY

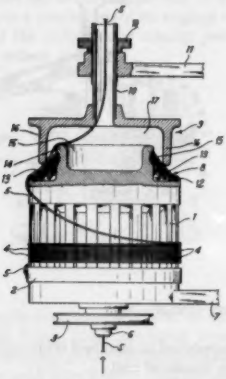
Ermanno Savio; Sergio Calamani, and Eugenio Turri, all of Milan, Italy, assignors to Savio & C. S.p.A., Milan, Italy

Filed Sep. 6, 1978, Ser. No. 940,218

Claims priority, application Italy, Sep. 29, 1977, 28087 A/77

Int. Cl.² B65H *51/20, 59/26*

U.S. Cl. 242—47.01 **3 Claims**



1. A device for controlling the tension in the yarn unwinding from a yarn carrying body, particularly from an apparatus for storing the yarn and feeding it to using machines, comprising two shaped bodies facing each other and coaxial with said yarn carrying body, the first shaped body being fast with the latter, while the second shaped body, having an axial hole passing therethrough for the passage of the yarn drawn from said carrying body and the tension of which has been controlled, is carried by a fixed bracket, wherein the outer edge of said first shaped body has a continuous series of elongated flexible hairs inwardly projecting therefrom and distributed according to a conical surface, with one end thereof fast with said edge, and inclined in a direction towards the second shaped body and in the tangential unwinding direction of the yarn, the other end of said hairs being free and positioned adjacent the free edge of an elongated annular projection axially extending from the first shaped body, an annular projection of an intermediate diameter between the diameters of the outer edge and annular projection of the first shaped body extending from the second shaped body to the first shaped body, under the device use conditions the free edge of the annular projection of the second shaped body contacting said hairs at an intermediate location of the length thereof.

4,153,215

DEVICE FOR SEVERING AND FEEDING TO RESPECTIVE REELS A WEB OF MATERIAL WOUND IN A TURN-OVER TYPE WINDING MACHINE

Wilhelm Schulze, Kreiensen, Fed. Rep. of Germany, assignor to Maschinenbau Greene GmbH & Co KG, Kreiensen, Fed. Rep. of Germany

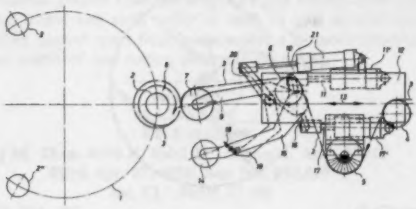
Filed May 10, 1978, Ser. No. 904,553

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1977, 2746862

Int. Cl.² B65H *19/20*

U.S. Cl. 242—56 A **6 Claims**

1. A device for severing and applying on a reel a continuous web of material wound in a winding machine having means for carrying and moving on a circular path a plurality of reels, comprising in combination: a support displaceable in two opposite directions relative to said circular path; web guiding means arranged on said support, said guiding means including a pivotably supported contact roller normally disposed outside said circular path in contact with the web roll wound on said reel; web transferring means arranged on said support and including a pivotably supported guiding roller and a pivotably supported severing member, said transferring means being normally disposed outside said circular path and out of contact with said web, said contact roller and said guiding roller being operable to move past an empty reel into a web transfer position in which the guiding roller and the contact roller are



spaced apart a minute distance from each other and said guiding roller stretches the web between the full reel and the empty reel; and said severing member being operable to sever the web section between said guiding roller and said new reel whereby the resulting free front edge of the web remains on the empty reel and is transferred to an intake slit between the contact roller and the empty reel.

4,153,216

APPARATUS FOR CHIP REMOVAL AND CHIP RECEIVING WHEN SEAMING METAL BANDS

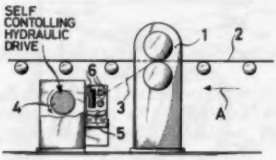
Karl-Heinz Becker; Friedhelm Günther; Manfred Gerber, and Werner Röll, all of Hamm, Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,947

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1977, 2701379

Int. Cl.² B65H *35/02*

U.S. Cl. 242—56.2 **3 Claims**



1. An apparatus for removing and receiving seam chips from metal bands being trimmed, which includes: automatically driven and self-controlling winding-up means for receiving and tautly winding-up the seam chips cut off from a metal band being trimmed, and chip guiding means reciprocable alongside the chip winding-up region for guiding engagement with the chip being fed to said winding-up means.

4,153,217

HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

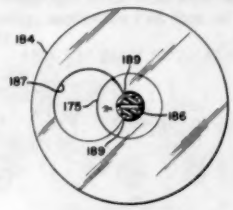
Division of Ser. No. 790,519, Apr. 25, 1977, Pat. No. 4,116,747. This application Feb. 7, 1978, Ser. No. 875,826

Int. Cl.² B65H *75/18*

U.S. Cl. 242—71.8 **4 Claims**

1. A reel comprising a pair of spaced apart hub members mounted for rotation about a common axis and adapted to project into opposite ends of a central hole in a roll, a pair of

discs adjacent the respective hub members, each disc having a continuous outer periphery, a first generally central hole and a larger second hole opening into the first hole, the second hole being larger in size than the exterior of the related hub member, each disc having a greater radial extent than the related hub member, means received in the first hole for mounting the



respective disc, means defining a gap at the opening between the first and second holes of each which is less than the outside dimension of the related mounting means, the discs being capable of being installed by passing the hub member through the respective second hole and thereupon shifting the disc so that the disc is snapped onto the respective mounting means.

4,153,218

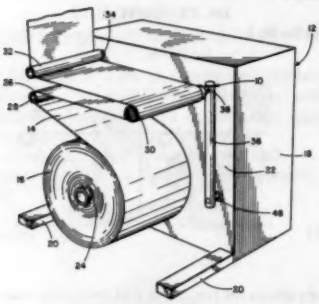
DANCER ASSEMBLY

John R. Martin, Martin Automatic, Inc, 1661 Northrock Ct., Rockford, Ill. 61103

Filed Apr. 27, 1978, Ser. No. 900,971

Int. Cl.[2] B65H *23/16*

U.S. Cl. 242—75.3 **5 Claims**



1. A dancer assembly for establishing a plurality of preselected operating tensions in a moving web comprising, in combination:

a first support member pivotable about an axis that is parallel to the planes defined by said web;

a second support member cantilevered on said first support member and having an outboard end;

a dancer roller; and

bearing means for rotatably mounting said dancer roller on said outboard end only of said second support member, said dancer assembly including no other means for mounting the dancer roller than said bearing means;

said first support member and said second support member matched so that over a range of pre-selected operating tensions, the deflections of said support members substantially cancel and said dancer roller is maintained in substantially parallel positions.

4,153,219

FISHING REEL

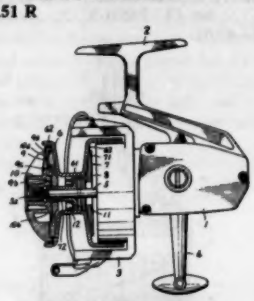
Kiyohide Kamikawa, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 10, 1978, Ser. No. 876,663

Claims priority, application Japan, Feb. 18, 1977, 52-19677[U]

Int. Cl.[2] A01K *89/00*

U.S. Cl. 242—84.51 R **8 Claims**



1. A fishing reel comprising;

a reel body;

a spool shaft supported to said reel body and having a screw thread at the foremost end;

a spool rotatably supported to said spool shaft, said spool having a trunk and front and rear walls extending radially outwardly from respective axial ends of said trunk, said spool shaft having a control member mounted non-rotatably thereto, said control member restricting said spool from being moved in one axial direction;

a single drag plate for applying resistance against the rotation of said spool with respect to said spool shaft, said drag plate being disc-like shaped, and comprising an outer peripheral portion adapted to be in contact with the outer surface of said front wall, a central portion being supported to said spool shaft in relation of being non-rotatable and slidable with respect thereto, and an intermediate portion between said central portion and outer peripheral portion which is elastically deformable axially of said spool shaft;

an adjustment knob screwed onto said screw thread of said spool shaft, said knob having a radially extending outer presser and a radially extending inner presser, said outer presser being moveable by the turning of said adjustment knob to contact with and urge said outer peripheral portion of said drag plate toward said spool front wall, said inner presser being moveable by the turning of said adjustment knob to contact with and urge said central portion of said drag plate toward said spool to thereby urge said outer peripheral portion toward said spool.

4,153,220

FISHING REEL

Kazunari Nakajima, Osaka, Japan, assignor to Nakajima Co., Ltd., Osaka, Japan

Filed Dec. 21, 1977, Ser. No. 862,885

Claims priority, application Japan, Dec. 24, 1976, 51-174799[U]; Dec. 24, 1976, 51-174800[U]

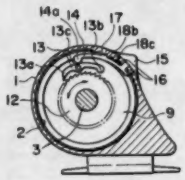
Int. Cl.[2] A01K *89/02*

U.S. Cl. 242—84.51 R **3 Claims**

1. A fishing reel comprising a reel body and a line spool, said reel body being formed with a concavity for receiving said line spool and a hollow spool shaft extending outwardly from the center of said concavity, said spool shaft being provided at diametrically opposite portions of its side wall in proximity to its end with through holes, an elastic U-shaped member inserted base end first in said hollow spool shaft and provided with outwardly projecting camming surfaces which extend through said through holes, and said line spool being formed

with a hollow portion to receive said spool shaft, the internal side wall of said hollow portion being provided with a groove for receiving said camming surfaces;

said line spool being provided with a ratchet wheel on one face thereof and said reel body is provided with a ratchet pawl member pivotally mounted within said concavity and adapted to cooperate with said ratchet wheel to control the rotary motion of said line spool on said spool shaft, said ratchet pawl member being formed with a pawl portion at one end and a rounded portion at the other end and rotating about a central pivot to engage one or the other or neither of the ends of said ratchet pawl member with said ratchet wheel; and



said body being further provided with an operating member and a thumb lever, said operating member extending through a hole in the outer periphery of said reel body and connected to said thumb lever and slidable thereby, said operating member having a rounded end in sliding contact with said ratchet pawl member and a protrusion in mating engagement with any of three grooves formed in the periphery of said concavity, said protrusion being moved between said three grooves by movement of said thumb lever so that said rounded end of said operating member is positioned at either side of or opposite said central pivot.

4,153,221

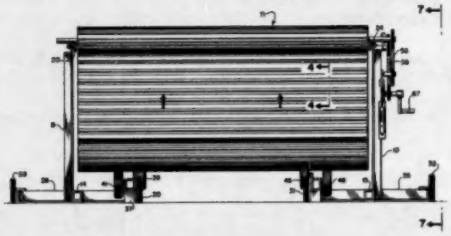
ROLLING DOOR CURTAIN MOUNTING APPARATUS

Douglas Howard, 10256 S. Choctaw, Baton Rouge, La. 70815

Filed May 31, 1977, Ser. No. 801,736

Int. Cl.[2] B65H *17/02, 75/40*

U.S. Cl. 242—86.52 **2 Claims**



1. An apparatus for mounting a rolling door curtain on a barrel assembly which will be attached in position about an opening that said door can close, which comprises:

(a) movable carriers having parallel spaced apart vertical members, each of said vertical members having a pair of spaced apart rollers rotatably connected thereto on which a shaft of said barrel assembly rests and between said rollers, each of said vertical members being perpendicularly attached to a base member supported on wheels; and

(b) rolling door curtain support brace assembly attached to each of said movable carriers below a position where said barrel assembly is attached, said rolling door curtain support brace assembly comprising second pairs of spaced apart rollers rotatably attached to said base members, each of said second pairs is attached to one of said base members and wherein a portion of each roller extends above said base member to which it is attached, said second pairs having cushioning means attached to said second pair of rollers' external surface which supports said rolling door curtain, said rolling door curtain constructed from strips having a width less than their length, said strips being hingedly connected to one another, each of said second pairs of rollers having a diameter greater than the width of said rolling door curtain strips and being spaced apart a distance greater than the length of said rolling door curtain strips, and each roller in each of said second pairs being spaced apart from one another a distance less than the width of said rolling door curtain strips.

4,153,222

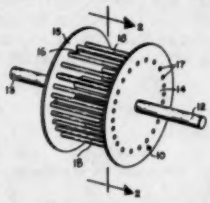
KITE REEL

Maung M. Than, 4456 E. Earll Dr., Phoenix, Ariz. 85018

Filed Apr. 27, 1978, Ser. No. 900,419

Int. Cl.[2] B65H *75/48*

U.S. Cl. 242—96 **10 Claims**



1. A kite reel comprising a spindle having a shaft affixed thereto and extending outwardly from the end thereof to form a pair of handles;

said spindle comprising a pair of circular discs forming end flanges therefor secured at least partly together by a plurality of cross braces said cross braces being in a circular array about said shaft; and

a plurality of small rods extending between said flanges to form a flexible skin for the spindle whereby when a wire is wound or unwound thereon or therefrom resilient tension is placed on said wire.

4,153,223

LIMITED-RANGE PROJECTILE HAVING A FLAT TRAJECTORY

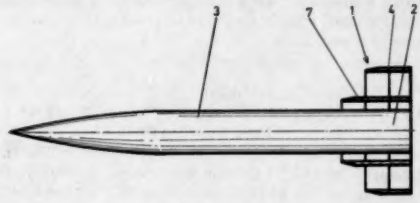
Rudolf Romer, Kaarst; Wolf Trommsdorff, Porz-Grengel, and Christian Jaeneke, Aachen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed May 27, 1977, Ser. No. 801,426

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1976, 2624524

Int. Cl.[2] F42B *13/00*

U.S. Cl. 244—3.1 **10 Claims**



1. A supersonic projectile having a velocity dependent resistance to air flowing therepast, comprising a body having a front portion and a rear portion forming a stabilizing tail unit, and means for channeling air flowing past said body so that

said flowing air travels smoothly through said channeling means when the velocity of said flowing air relative to said body is greater than a predetermined value, and so that said channeling means are choked when said relative velocity is less than said predetermined value, said channeling means comprises a plurality of channels passing therethrough, said channels being positioned about said rear portion of said body forming a stabilizing tail unit, each of said channels having a front opening toward said front portion of said projectile determining a capture cross section, and a rear opening positioned toward said rear portion of said projectile determining an exit cross section, and at least one wall of variable thickness forming said channel by connecting said front opening and said rear opening, which wall of variable thickness is so constructed that an area of reduced cross section is formed between said front opening and said rear opening, whereby the value of said velocity dependent air resistance is substantially greater when said velocity is less than said predetermined value than when said velocity is greater than said predetermined value, thereby air flowing from said front opening through said channeling means and out said rear portion is compressed while passing through said channeling means, this compression being connected with an energy loss, serving to control the velocity dependence of the air resistance of the projectile.

4,153,224

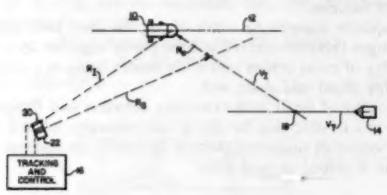
LASER COMMAND GUIDANCE SYSTEM

Robert W. Rampolla, and Brewton O. Van Hook, both of Ellicott City, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 29, 1976, Ser. No. 654,304

Int. Cl.[2] F41G *7/12, 7/00;* **F42B** *15/02*

U.S. Cl. 244—3.16 **3 Claims**



1. A command guidance system for a flight vehicle having an optical tracker thereon, said system including remote means for determining a desired flight path for said vehicle, means for directing a first pulsed laser beam toward said vehicle to be received thereon, means for directing a second pulsed laser beam in a direction to intersect said desired flight path at a predetermined distance from the vehicle, said vehicle having means for gating said tracker ON in response to receipt of a pulse of said first laser beam after a time delay, and means for firing a pulse of said first laser beam and for firing a pulse of said second laser beam at a time thereafter such that the pulse of the second beam crosses said desired flight path at a time to irradiate said tracker while it is gated ON, the tracker having means for controlling the vehicle to cause it to fly toward the source of illumination.

4,153,225

ELECTRICAL/ELECTRONIC ROCK EQUIPMENT BAY FOR AIRCRAFT

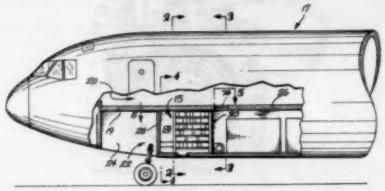
Donald E. Paulsen, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Napoli, Italy

Division of Ser. No. 653,023, Jan. 28, 1976, Pat. No. 4,089,040. This application Dec. 5, 1977, Ser. No. 857,432

Int. Cl.[2] B64D *43/00*

U.S. Cl. 244—118 R **2 Claims**

1. In an aircraft of the type having an internal deck dividing the fuselage thereof into upper and lower lobes, an avionics bay located in said lower lobe and bounded by the underside of said deck, the interior wall of said lower lobe and transversely extending fore and aft walls, the improvement wherein said bay contains a pair of avionics equipment racks separated by a central access aisle extending lengthwise of the fuselage between said fore and aft walls, the fronts of the racks facing one another across said central aisle, said racks being spaced from the sides of said lower lobe such that there is defined therebetween two outboard aisles extending parallel to and elevated with respect to said central aisle, both racks being spaced from the fore or aft wall so as to define therebetween a transversely extending passageway interconnecting said central aisle with said outboard aisles, and wherein said transversely extending passageway comprises first and second sets of stairs arranged



on opposite sides of said central aisle and rising upwardly and diverging transversely outwardly from the level of said central aisle to the elevated level of said outboard aisles, and wherein the improvement further comprises a ground-crew hatch and an in-flight access hatch, said ground-crew access hatch being disposed in the bottom of said fuselage and opening upwardly into said avionics bay through said central aisle, and said in-flight access hatch being disposed in said deck and opening downwardly into said avionics bay at a location above one of said two outboard aisles, whereby both ground crews and in-flight attendants are provided with access to both the fronts and rears of said racks via said sets of stairs forming said transversely interconnecting passageway.

4,153,226

SUPPORTING MECHANISM

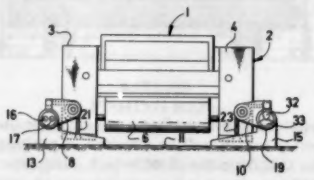
Karel Kakac; Adolf Slezak, both of Brno, and Jaroslav Janda, Ceska u Brna, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Dec. 8, 1977, Ser. No. 858,910

Claims priority, application Czechoslovakia, Dec. 8, 1976, 8004-76

Int. Cl.[2] F16F *15/00*

U.S. Cl. 248—659 **6 Claims**



1. A supporting mechanism for weaving machines mounted on a base, comprising in combination,

a plurality of supporting levers,

a corresponding plurality of support brackets mounted on said base, each lever being pivotally supported on a bracket and biased against the weight of the weaving machine,

said weaving machine having a frame,

said frame being operatively connected to said plurality of supporting levers; and

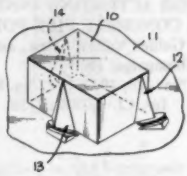
a pair of torque rods, each torque rod being operatively secured, on the one hand, to a supporting lever and, on the other hand, to a bracket disposed oppositely said supporting lever.

4,153,227

FLUID SELF-CENTERING VIBRATION AND SHOCK MOUNT

Roger L. Gamaunt, P.O. Box 55, Fawnskin, Calif. 92333

Continuation of Ser. No. 635,931, Nov. 28, 1975, abandoned.
This application Aug. 19, 1977, Ser. No. 826,141
Int. Cl.[2] B29B *1/08*; B29C *1/16*
U.S. Cl. 248—575 **17 Claims**



1. A vibration suppressing, self-centering support mount for supporting a load on a base comprising at least three suspension assemblies interconnecting said load with said base wherein each of said suspension assemblies has a line of action which is oriented to intersect the center of gravity of the load for providing a three-dimensional, three-point suspension of said load over said base regardless of the attitude of said load, and wherein each of said suspension assemblies includes

(a) a bottom bracket engaged to said base and having an upper face tilted at a substantially 30° angle relative to said base for applying a load centering force on said load,

(b) a top bracket mounted on said load and having a lower face opposed to and parallel with said upper face of said bottom bracket,

(c) a pneumatic element disposed between said opposing, parallel upper and lower faces of said brackets for both suppressing the transmission of vibrations between said load and said base and transmitting said load-centering force from said bottom bracket to said top bracket, said pneumatic element being formed from a thin walled, annular tube composed of an elastic material and filled with a gas to a pressure of substantially four pounds per square inch above the ambient atmospheric pressure,

(d) a pan-shaped element mounted on a selected one of said opposing, parallel faces of said brackets for flexibly securing said pneumatic element between said parallel, opposing upper and lower faces of said bottom and top brackets, said pan-shaped element including a circular sidewall of a height less than the height of said thin-walled, annular tube forming said pneumatic element for receiving said element,

whereby said pneumatic element of each suspension assembly cooperates with said tilted, parallel, opposing faces of said bottom and top brackets and said pan-shaped element of each assembly to provide a vibration suppressing, self-centering support mount.

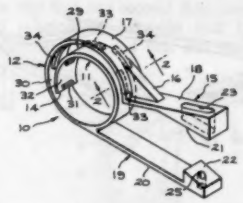
4,153,228

SELF-TIGHTENING CLAMP

Samuel Delserro, Easton, Pa., and Samuel B. Hsueh, Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 3, 1977, Ser. No. 838,607
Int. Cl.[2] F16L *3/12*
U.S. Cl. 248—74 PB **14 Claims**

1. A clamp including a first curved portion, a second curved portion, said second curved portion having one end connected to one end of said first curved portion so that said first curved portion and said second curved portion form a continuous, uninterruputed curved surface, said second curved portion overlapping a portion of said first curved portion including the free end of said first curved portion, a base connected to at least one of said first curved portion and said second curved portion, extension means connected to said second curved portion and spaced from said base, said extension means extending from said second curved portion in substantially the



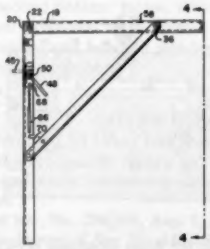
same direction as said base, means to reduce the distance of said extension means from said base to reduce the curvatures of said first curved portion and said second curved portion to cause at least said first curved portion to engage an article to be clamped, and each of said base and said extension means having cooperating means engaging each other to cause movement of said extension means relative to said base when said reducing means is effective.

4,153,229

FOLDING SCAFFOLD SUPPORT

Noah L. Bequette, P.O. Box 663, Cedar Hill, Mo. 63016

Filed Nov. 21, 1977, Ser. No. 853,110
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—240.3 **6 Claims**

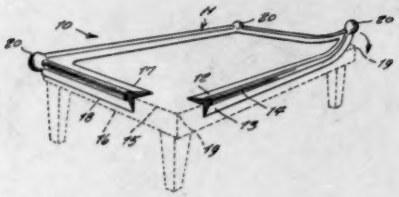


1. A folding scaffold support comprising first and second channel members attached at their ends by pivot means so that the second channel can pivot to be disposed within the first, braces attached to the second channel by means which permit them to rotate, means at the remote ends of said braces to enable them to be attached to the first channel temporarily to position the second channel at right angles to the first, a series of elongated slot openings in the base of said first channel spaced to receive steel pins which protrude from vertically arranged construction, and cam lock means on the base of said first channel located adjacent one of said slot openings to lock said first channel to one of said steel pins and to said construction.

4,153,230
BABY BUMPERS

Terry L. Giacin, c/o Paul E. Wade, 1884 Edgewater Dr., Cincinnati, Ohio 45239

Filed May 9, 1977, Ser. No. 795,197
Int. Cl.[2] A47B 97/00; A47D 15/00
U.S. Cl. 248—345.1 2 Claims

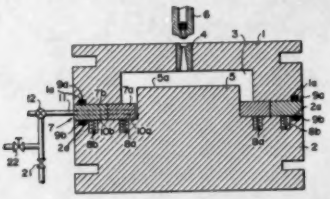


1. A baby bumper, comprising, in combination, a beading made of a soft, stretchable rubber, said beading being extendible around a peripheral edge of furniture; said beading comprising a pair of elongated flaps, each of which, along one longitudinal edge, junctions with a longitudinal extending, transversely rounded bulge, each said flap tapering transversely toward its opposite longitudinal edge, a space between said flaps for said furniture peripheral edge being grasped therein by said flaps; spherical-shaped protrusions being formed along said beading, for positioning at corners of said furniture, said spherical protrusions each comprising an outwardly extending, thick mass of said soft rubber, that is larger than said bulge, so as to protrude further outwardly.

4,153,231
MOULD ASSEMBLY FOR FOAM MOULDING OF PLASTIC MATERIALS

Akifumi Hayakawa, Tokyo; Akira Aiba, Kawasaki; Eiki Orihara, Tokyo, and Kiyoshi Fukushima, Fujisawa, all of Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1977, Ser. No. 848,321
Claims priority, application Japan, Nov. 8, 1976, 51/133269; Nov. 8, 1976, 51/133270
Int. Cl.[2] B29D 27/00
U.S. Cl. 249—82 5 Claims

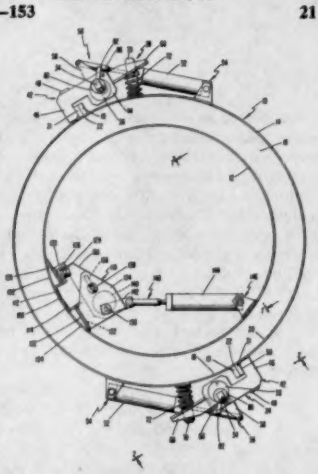


1. Mould assembly for foam moulding which comprises a stationary die, a movable die co-operating with said stationary die to form a mould cavity therebetween and movable to change the volume of said mould cavity, auxiliary die means disposed between said stationary and movable dies and having surface means exposed to said mould cavity, means operatively associated with one of said stationary and movable dies for biasing said auxiliary die means toward the other of said stationary and movable dies, means for introducing pressurized gas into said mould cavity, means for drawing gas from said mould cavity, and seal means disposed between said auxiliary die means and said stationary and movable dies, said auxiliary die means including a first auxiliary die having said surface means exposed to said mould cavity and a second auxiliary die located radially outside the first auxiliary die, said first and second auxiliary dies being independently biased by said biasing means, said seal means being disposed between said second auxiliary die and said stationary and movable dies.

4,153,232
APPARATUS FOR ACTUATING INNER AND OUTER FORMS OF A CONCRETE PIPE FORMING MOLD

Keith L. Burchett, Golden Valley, Minn., assignor to C.S. Johnson Company, Champaign, Ill.

Filed Nov. 28, 1977, Ser. No. 855,390
Int. Cl.[2] B28B 21/88
U.S. Cl. 249—153 21 Claims



1. In a molding apparatus for fabricating concrete pipe of the type including an inner mold form and an outer mold form which comprises a pair of form sections that are completely separable along two gates, and clamping means at each gate for releasably securing said form sections together and enabling said form sections to be completely separated for the removal of hardened pipe, the improvement wherein each clamping means comprises:

an eccentric disc mounted for rotation on one of said form sections;

a flange on the other form section;

a locking arm mounted on said eccentric disc for rotation relative thereto;

said locking arm including a clamping portion which is engageable with said flange on said other form section and is completely disengageable therefrom in response to selective rotation of said eccentric disc;

motor means operably connected to said eccentric disc for rotating the latter in one direction to displace said clamping portion away from said flange, and in the other direction to bring said clamping portion into engagement with said flange, and

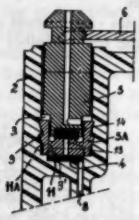
contact surface means rotatable with said eccentric disc, said contact surface means being engageable with a portion of said locking arm during displacement of said clamping portion away from said flange to impart rotation to said locking arm relative to said eccentric disc in a manner displacing said clamping portion away from said flange.

4,153,233

VALVE FOR DISPOSABLE GAS LIGHTER

Guy Neyret, Francheville, France, assignor to Etablissements Genoud & Cie, Venissieux, France

Division of Ser. No. 611,264, Sep. 8, 1975, Pat. No. 4,072,290. This application Jul. 20, 1977, Ser. No. 817,423
Claims priority, application France, Sep. 10, 1974, 74 31436
Int. Cl.[2] F16K *47/14*; F23D *13/04*
U.S. Cl. 251—127 **4 Claims**



1. A valve for a lighter having a reservoir for a compressible fluid, comprising:

a housing formed unitarily with an upright well, defined by a cylindrical wall, a gas outlet communicating with said reservoir and opening into said well at the bottom thereof, and a shoulder surrounding said outlet at said bottom of said well, said well having a mouth above said outlet;

a compressible unapertured diffuser filter disk member of porous material in line with said outlet and directly resting upon said shoulder;

a valve seat member press-fittedly received immovably in said well and permanently laterally engaging said wall, said valve seat member having a pair of opposite sides while being formed with a passage extending between said sides, one of said sides bearing against and directly compressing said disk member against said shoulder whereby fluid exiting from said reservoir through said outlet enters said passage well only upon diffusion through said disk member, said valve seat member terminating below said mouth; and

a valve body movable relative to said seat member sealingly engageable over said passage at the other side of said seat member.

4,153,234

WALL SUPPORTED HANDRAIL ASSEMBLY

Edward F. Sherwood, Gettysburg, Pa., and Larry M. Markle, Harney, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 13, 1978, Ser. No. 924,421
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—69 **10 Claims**

1. A handrail assembly adapted for mounting between two spaced parallel surfaces, comprising:

an elongated handrail member having a longitudinal axis which extends between first and second ends, and a predetermined length dimension,

said handrail member including wall portions, at least at its first and second ends, which define first and second cavities which extend inwardly from said first and second ends, respectively,

first and second slots in said wall portions which extend inwardly from such first and second ends, respectively, said first and second slots providing access to said first and second cavities, respectively, from a direction transverse to the longitudinal axis of said handrail member,

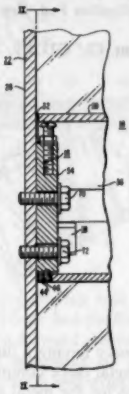
first and second spaced members having first and second vertically oriented parallel surfaces, respectively,

first and second bracket members,

means mounting said first and second bracket members on said first and second surfaces, respectively,

the length dimension of said handrail member being selected such that the handrail member will extend between said first and second surfaces with predetermined small clearances between its first and second ends and said first and second surfaces, respectively,

said first and second bracket members being dimensioned to enable them to enter said first and second cavities, respectively, via said first and second slots, and establish a first positional relationship between said first and second bracket members and said first and second cavities, respectively,



said first and second cavities and said first and second bracket members being cooperatively dimensioned to permit rotation of said handrail member, after said first and second bracket members have entered said first and second slots, with said rotation establishing a second positional relationship which prevents removal of said handrail member from said bracket member,

and first and second adjustable fastener means in the wall portions of said handrail,

said first and second bracket members being configured to cooperate with a predetermined actuated condition of said first and second fastener means, respectively, to maintain said second positional relationship and prevent rotation and removal of said handrail member from said first and second bracket members.

4,153,235

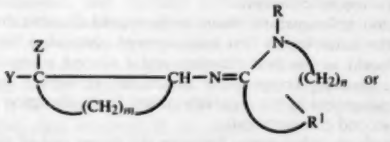
SUBSTITUTED CYCLOALKYL LACTAMIMIDES

Johann M. Grisar; Thomas R. Blohm, and Edward M. Roberts, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 386,995, Aug. 9, 1973, which is a continuation-in-part of Ser. No. 143,259, May 13, 1971, abandoned. This application Feb. 14, 1978, Ser. No. 877,653
Int. Cl.[2] C07D *207/22, 211/72, 223/04, 225/02*
U.S. Cl. 260—239 B **2 Claims**

1. A compound selected from

(A) a compound of the formula



(B) a pharmaceutically acceptable acid addition salt thereof,

wherein Y is selected from the group consisting of cycloalkyl of from 5 to 7 carbon atoms; Z is hydroxy; R is selected from the group consisting of hydrogen, lower alkyl of from 1 to 4 carbon atoms, phenyl or benzyl; R^1 is selected from the group consisting of hydrogen, halogen or lower alkyl of from 1 to 4 carbon atoms; m is an integer of from 3 to 6; and n is an integer of from 3 to 11.

4,153,236

PREHEATING FURNACE

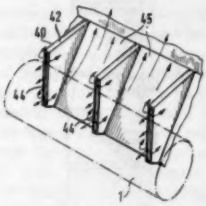
Friedrich W. Elhaus, Hofkamp 140, Wuppertal, Fed. Rep. of Germany

Filed Aug. 16, 1977, Ser. No. 825,099

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637646

Int. Cl.[2] C21D *9/70*

U.S. Cl. 266—252 **6 Claims**



1. A preheating furnace having a furnace chamber for preheating an extended metal piece comprising:

transportation means for the metal arranged in the furnace chamber;

at least one treatment chamber in the furnace chamber for containing and treating the metal;

at least one pressure chamber in the furnace chamber into which hot gas is blown under pressure; and

a plurality of rows of slot-type nozzles arranged laterally symmetrically from the metal and extending through a partition which subdivides the furnace chamber into said treatment chamber and said pressure chamber whereby hot gas is adducted to the metal so that warping of the metal is prevented, said nozzles having elongated openings disposed with the longer axis of each opening transverse to the longitudinal axis of the metal.

4,153,237

HYDRAPNEUMATIC SUSPENSION UNIT AND VALVING STRUCTURE

Steven A. Supalla, 3545 SW. 124th Ave., Beaverton, Oreg. 97005

Filed Nov. 1, 1976, Ser. No. 737,852

Int. Cl.[2] F16F *9/34*

U.S. Cl. 267—64 R **3 Claims**

1. A hydrapneumatic suspension unit, comprising:

(a) a first chamber,

(b) a piston movable longitudinally in the first chamber,

(c) a piston rod extending from one side of the piston through one end of the first chamber,

(d) the piston end of the chamber containing an hydraulic liquid, there being no restricted flow of said liquid to opposite sides of the piston to cause restricted movement of the piston,

(e) a second chamber,

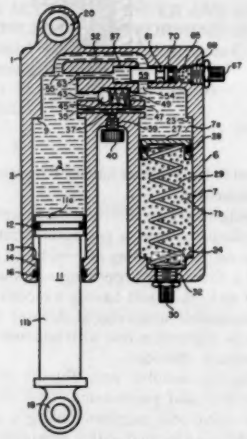
(f) movable separator means in the second chamber dividing the latter into a first compartment containing the same liquid as the first chamber and a second compartment containing compressible means for resiliently resisting movement of the separator means in the direction of the second compartment,

(g) check valve means between the piston end of the first chamber and first compartment for permitting rapid flow of liquid only from the first chamber to the first compartment,

(h) damper valve means between the piston end of the first chamber and the first compartment for permitting restricted flow of liquid from the first compartment to the first chamber,

(i) bypass valve means between the piston end of the first chamber and the first compartment for permitting flow of liquid from the first compartment to the first chamber at a rate substantially greater than the rate of flow through the damper valve means,

(j) one end of the bypass valve means communicating with the piston end of the first chamber and the liquid contained therein, and



(k) resilient means engaging the end of the bypass valve means opposite the end communicating with the first chamber and providing a reference pressure independent of the liquid pressure in the first compartment and the only pressure opposing the liquid pressure in the first chamber, whereby when the liquid pressure in the first chamber is lower than the reference pressure provided by the resilient means the bypass valve means is moved to open communication between the first chamber and first compartment, and when the liquid pressure in the first chamber is higher than the reference pressure provided by the resilient means the bypass valve means is moved to close communication between the first chamber and first compartment.

4,153,238

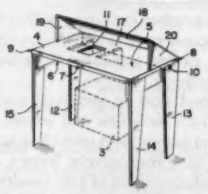
NUT CRACKER TABLE

Jewel F. Tabor, P.O. Box 869, Water Valley, Tex. 76958

Filed Apr. 10, 1978, Ser. No. 894,808

Int. Cl.[2] B25B *11/00*

U.S. Cl. 269—15 **1 Claim**



1. A nut cracker table for accommodating a nut cracking

device, directing shelled nuts to a specific area and preventing the hulls from scattering, said nut cracker table comprising

a substantially rectangular board-like table top having an oversurface, a spaced parallel undersurface, spaced parallel front and rear edges and a pair of spaced parallel side edges perpendicular to the front and rear edges and joining said front and rear edges, said table top having a hole formed therethrough;

a plurality of legs supporting said table top at a distance above a supporting surface;

a chute affixed to the undersurface of said table top under the hole through said table top for directing shelled nuts to a specific area under said table top; and

a shield affixed to the oversurface of said table top for preventing the hulls of nuts cracked by a nut cracking device on said oversurface from scattering, said shield having a back part extending over the oversurface of said table top from the rear edge of said table top at an angle with said table top and a pair of side parts each extending from said back part to a corresponding one of the side edges of said table top, said side parts extending substantially perpendicularly to said oversurface.

4,153,239

ADAPTOR FOR MACHINE TOOL FIXTURE

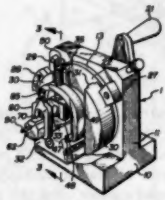
Lawrence La Rocco, 826 N. Grant St., Addison, Ill. 60101

Continuation of Ser. No. 672,734, Apr. 1, 1976, Pat. No. 4,070,012. This application Aug. 29, 1977, Ser. No. 828,927

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.[2] B23Q *3/06*

U.S. Cl. 269—287 **1 Claim**



1. A tool holding device for holdir g a tool in a fixture and adapted for use with a fixture having a seat therein and a locking means normally adapted for maintaining a tool in position in said fixture seat, said tool holding device comprising:

a first portion comprising means for mating with said fixture seat to enable said fixture locking means to lock and maintain said device in said fixture seat with said first portion having a top and side walls;

said first portion side walls having surfaces which are adapted to substantially conform to the fixture seat;

a second portion connected to and extending outwardly from said first portion and comprising means for seating at least a portion of a tool in a position whereby said tool portion is spaced from said fixture to allow a machining operation to be performed on said tool portion.

4,153,240

AUTOMATIC TRANSFER APPARATUS

Gilbert M. Gouley, Saint-Andres-les-Vergers, France, assignor to Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Filed Apr. 22, 1977, Ser. No. 789,986

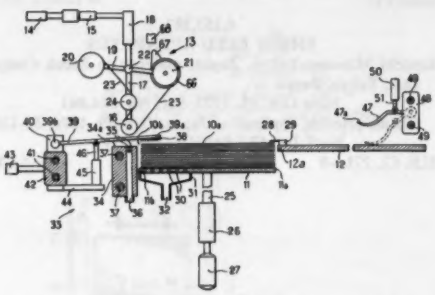
Claims priority, application France, Apr. 26, 1976, 76 12318

Int. Cl.[2] B65G *59/02*

U.S. Cl. 270—68 R **12 Claims**

4. An automatic transfer apparatus for transferring textile articles such as pieces of knitted wear stacked on support platform one by one onto a table, the apparatus comprising:

at least one gripping head including support means, a gripping finger mounted for vertical movement relative to said support means, first drive means for vertically moving said gripping finger between a gripping position adjacent said platform to a position above the platform, and adhesive means on said gripping finger for engaging by pressure an article on the top of said stack when said gripping finger is in said gripping position.



second drive means for moving said gripping head backwards and forwards over said platform and table between a rear position and a forward position,

separating means for separating by pulling a transferred article on said table from said gripping finger during the backwards movement of said gripping finger, and

suction means connected to passages formed in said support platform and opening in the upper surface thereof covered by said stack.

4,153,241

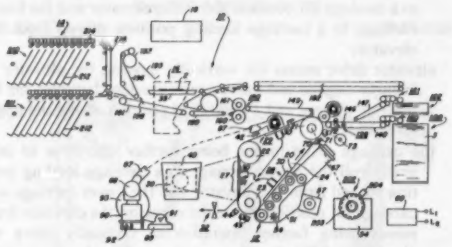
DOUBLE DOCUMENT FEED DETECTION FOR A DOCUMENT HANDLER IN A REPRODUCTION MACHINE

Philip J. Batchelor, and Ernest L. Legg, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,024

Int. Cl.[2] B65H *7/02*

U.S. Cl. 271—4 **2 Claims**



1. In a reproduction machine for making copies from original documents, said machine including document handler means for transporting successive sets of documents between an input tray and an exposure platen so that copies therefrom can be produced, the improvement comprising a method of insuring that the total number of documents transported to the platen is the same for each set cycle, said method comprising:

feeding each document to the platen;

incrementing a document counter every time a document is removed from the platen;

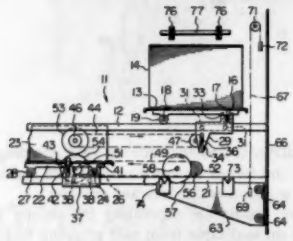
storing the total number of documents placed on the platen for the first set cycle;
detecting when the last original has left the input tray for subsequent sets;
adding to the contents of the document counter for said subsequent sets a sufficient number to account for those documents not yet registered by the document counter;
comparing this number with the stored document total before the last original is removed from the platen; and
displaying a fault if the comparison is not equal.

4,153,242

SHEET FEED APPARATUS

Kenichi Mizuma, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,861
Claims priority, application Japan, Oct. 29, 1976, 51-131095
Int. Cl.[2] B65H *1/26, 1/14*
U.S. Cl. 271—9 **6 Claims**



1. A sheet feed apparatus comprising:
an upper pair of horizontal rails;
an upper sheet carriage rollingly supportable on the upper rails;
a lower pair of horizontal rails disposed directly below the upper rails;
a lower sheet carriage rollingly supportable on the lower rails, the upper rails being spaced further apart than the lower rails to such an extent that the lower carriage may pass vertically between the upper rails;
an elevator which is vertically movable through the lower and upper rails;
carriage drive means for integrally rolling the upper carriage to a carriage lift position above the elevator and the lower carriage to a carriage loading position spaced from the elevator;
elevator drive means for vertically moving the elevator to liftingly engage and move upper carriage between the lift position thereof and a sheet feed position above the upper rails; and
the carriage drive means being further operative to integrally roll the upper carriage to a carriage loading position spaced from the elevator and the lower carriage to a carriage lift position above the elevator, the elevator drive means being further operative to vertically move the elevator to liftingly engage and move the lower carriage between the lift position thereof and said sheet feed position above the upper rails.

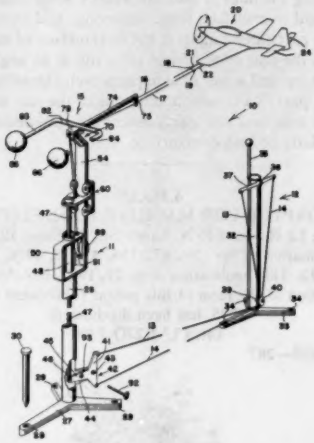
4,153,243

REMOTE CONTROL DEVICE FOR MODEL AIRPLANE

Dewitt L. Batchelor, P.O. Box 303, Guthrie, Ky. 42234

Filed Nov. 25, 1977, Ser. No. 854,712
Int. Cl.[2] A63H *27/04*
U.S. Cl. 272—31 A **8 Claims**

1. A remote control device for a model airplane having elevator controls, comprising:
(a) an upright mast having a base for supporting said mast on a stationary surface,
(b) a rotary bracket supported upon said mast for rotary movement about a vertical axis,
(c) an elongated guide arm having remote and proximal end portions,
(d) means for journaling the proximal end portion of said guide arm on said rotary bracket for swinging movement of said guide arm about a horizontal axis,
(e) control lines mounted on said guide arm for guided linear movement, said control lines having remote ends connectable to the elevator controls of a model airplane, and proximal end portions extending from the proximal end portion of said guide arm,



(f) a control line carrier mounted on said rotary bracket for vertical reciprocal movement,
(g) a reversing guide member on said rotary bracket,
(h) the proximal end of one of said control lines being directly fixed to said carrier, and the proximal end of another of said control lines being directed around said reversing guide member and fixed to said carrier, whereby the vertical movement of said carrier on said rotary bracket in one vertical direction causes the remote ends of said control lines to move in opposite directions and the movement of said carrier in said opposite vertical direction causes the remote ends of said control lines to move in directions reversed to said opposite directions,
(i) actuator means connected to said carrier for moving said carrier in opposite vertical directions.

4,153,244

GYMNASTIC SET FOR WHEELCHAIR PATIENTS

Carl F. Tauber, Jr., Baltimore, Md., assignor to Leonard F. Zullo, Baltimore, Md.

Filed Jul. 14, 1977, Ser. No. 815,693
Int. Cl.[2] A63B *21/06*
U.S. Cl. 272—117 **5 Claims**

1. A gymnastic exercise system for wheel chair patients comprising:
a base framework surrounding two sides and the back of a wheelchair, said base framework having a super-structure above a wheelchair and a lower framework removably attached to said base framework in front of a wheelchair;
a plurality of exercise structures connected to said base framework, said super-structure, and said lower framework;
a left horizontal top side rail;
a left horizontal bottom side rail spaced apart from said left

top side rail parallel thereto and in the same vertical plane as said left top side rail and spaced from a floor;

a right horizontal top side rail parallel to said left horizontal top rail and spaced apart from said left horizontal to rail;

a right horizontal bottom side rail spaced apart from said right top side rail and parallel thereto and in the same vertical plane as said right top side rail and spaced from a floor;

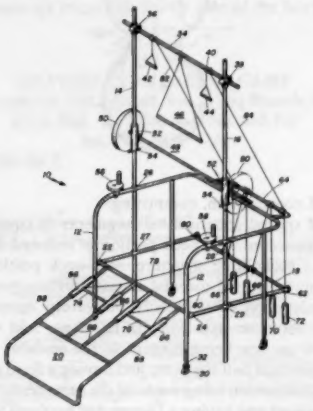
a vertical left front post extending from said left horizontal top side rail and connected thereto and extending downward to a floor and further connected to said left horizontal bottom rail;

a vertical right front post extending from said right horizontal top side rail and connected thereto and extending downwardly to a floor and further connected to said right horizontal bottom rail;

a vertical left rear post extending from said left horizontal top side rail and connected thereto and extending downwardly to a floor and further connected to said left horizontal bottom rail;

a vertical right rear post extending from said right horizontal top side rail and connected thereto and extending downwardly to a floor and further connected to said right horizontal bottom rail;

a rear transverse top rail connected to said left horizontal top rail at rear end thereof and connected to said right hori-



zontal top rail at rear end thereof, so as to permanently space said left horizontal top rail from said right horizontal top rail to clear a typical wheelchair and form the framework into a single unit;

a support bar for cable pulleys spaced apart from and attached to said rear transverse top rail, attachment being made at the ends of said support bar;

a rear transverse bottom rail removably connected to said left horizontal bottom rail at rear end thereof and removably connected to said right horizontal bottom rail at rear end thereof, said rear transverse bottom rail serving as a support bar for cable pulleys, said rear transverse bottom rail serving to immobilize the unit by passing through the wheels of said wheelchair;

a super-structure for said base framework comprising two long vertical posts, one right and one left, extending from a floor to a point above a wheelchair, said long vertical posts each connected to said respective left and right horizontal top and bottom side rails, and having a traverse bar at the upper end of said two long vertical posts and connected thereto, said transverse bar serving as a support bar for cable pulleys and as a support several exercise structures; and

a lower framework for said base framework comprising a more or less "U" shaped member connected at the free ends to a horizontal member which in turn is removably connected to said left and right horizontal bottom rails, and "U" shaped member having connected therein a leg exercise structure.

4,153,245

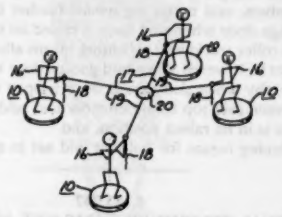
GAME OF PHYSICAL SKILL

Kenneth H. McCoy, 11714 Goshen Ave., Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 711,731, Aug. 5, 1976. This application Sep. 12, 1977, Ser. No. 832,228

Int. Cl.[2] A63B *71/00*

U.S. Cl. 273—1 R **22 Claims**



1. A game of physical skill to be played by at least two persons comprising a pair of spaced mats for participants to stand on and a hand line to be grasped by persons standing on said mats respectively, said mats imprinted with a plurality of different participant standing positions.

2. A game of physical skill to be played by at least two persons comprising a pair of spaced roller skate boards for participants to stand on and a hand line to be grasped by persons standing on said roller skate boards respectively.

4. A game of physical skill to be played by at least two persons comprising a pair of spaced encompassing standing boundaries for a participant to stand within and a hand line to be grasped by persons standing within said boundaries respectively, and grip means for each participant slidably received over said hand line to grip the same by hand manipulation.

4,153,246

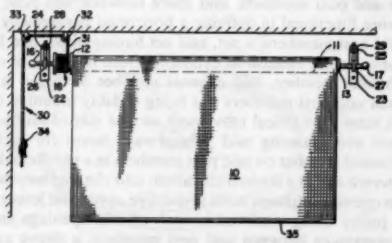
SPORTS NET

Patrick J. Byrne, 854 Keystone Dr., Cleveland Heights, Ohio 44121

Filed Jul. 25, 1977, Ser. No. 818,395

Int. Cl.[2] A63B *69/00*

U.S. Cl. 273—26 A **5 Claims**



1. A sports net and mounting structure thereof for use in connection with ball games such as golf, tennis, baseball, basketball and the like, comprising:

(a) an extensive main scrim-type netting;

(b) a roller for storing and supporting said netting under the stress of a ball projected thereagainst when said netting is supported in a vertical plane when in use;

(c) said roller comprising a rigid plastic tubing;

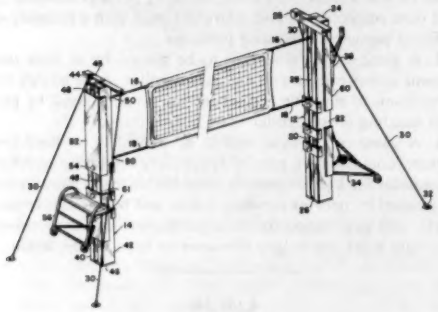
(d) filler material in said tubing for further rigidifying said roller;
(e) a high impact plastic material end cap attached at each end of said roller;
(f) a tensile material extending longitudinally through said roller and having opposite ends attached to a respective cap for further rigidifying said roller;
(g) means mounting said roller;
(h) said mounting means being fastened to a garage inwardly of a garage door which is vertically movable on roller tracks and a door opening for said door; said opening having side and top framing members, said mounting means being above the level of the top and side framing members, said mounting means further being above said garage door when said door is raised on said roller tracks, said roller tracks and mounting means allowing said sports net to be lowered when said garage door is closed or open, whereby when said garage door is open said net can pass between said top frame member and said door when said door is in its raised position; and
(i) fastening means for holding said net in a stored position.

4,153,247

EQUAL TENSIONED GAME NET ASSEMBLY

Everett M. Burns, 8580 W. 45th Ave., Wheatridge, Colo. 80033

Filed Nov. 17, 1977, Ser. No. 852,490
Int. Cl.[2] A63B *69/00*
U.S. Cl. 273—29 BC **9 Claims**



1. A game net support post assembly comprising; first and second, spaced apart, vertically extending, net support posts, said first support post comprising; two vertically extending and parallel post members, said post members being held in a spaced apart position by a top plate and a bottom plate, each of said plates being attached to respective upper and lower ends of said post members, said space between said post members being functional in defining a horizontal passageway between said post members; a net, said net having upper and lower net supprt cable extensions extending from its ends; an elongated channel member, said channel member having a length less than said post members and being slidably mounted on one of its sides for vertical movement on one side of said post members and spanning said passageway; means for locking said channel member on said post members in a parallel relationship thereto and at a desired elevation; said channel member having an opening adjacent to its respective upper and lower ends and a pulley being mounted in each of said openings and in said passageway between said post members; a sleeve guide; said sleeve guide being fixedly attached to said channel member on the side opposite said one side thereof; net tensioning means; said net tensioning means having a sleeve attached thereto, said sleeve slidably receiveing said sleeve guide and adjustably attaching said net tensioning means to said channel member;

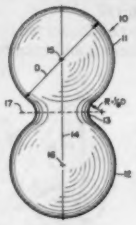
One end of said net having said cable extensions attached to said second post and each of said upper and lower cable extensions at the other end of said net respectively extending from the side opposite said one side of said post member through said upper and lower openings, respectively trained over said upper and lower pulleys of said first post; said upper pulley directing said upper cable extension downwards and said lower pulley directing said lower cable upwards, each of said cables being subsequently attached to said net tension means, said net tensioning means being adapted to move said cables in opposite directions while being slidably displaced on said sleeve guide and relative to said post members for uniformly tensioning said cables.

4,153,248

BALL

Dale E. Holmes, 329 E. Prospect, Marshall, Mich. 49068; Donald W. Konkle, 4243 18-1/2 Mile Rd., Tekonsha, Mich. 49092; C. James Warner, 128 Winter, Battle Creek, Mich. 49016, and Richard L. Hansen, 90 College St., Battle Creek, Mich. 49017

Filed Dec. 16, 1977, Ser. No. 861,364
Int. Cl.[2] A63B *37/00*
U.S. Cl. 273—58 A **3 Claims**



1. A ball construction, comprising:
a pair of spaced spherical ball segments of equal diameter interconnected by a neck portion of reduced diameter to form a monolithic structure, said neck portion being a continuous partial toroidal arcuate surface generated by the revolution of a radially outwardly opening planar curve about an axis lying in its plane, said continuous arcuate surface being tangent to the surfaces of both of said spherical ball segments and having a fixed radius, said ball construction being made of the same resilient material throughout and having a Durometer hardness value in the range of 40 Shore A to 60 Shore A and the masses of said spherical ball segments and said neck portion are equal on opposite sides of a plane containing the revolved center of said planar curve forming said partial toroidal surface.

4,153,249

BIOENGINEERED GAME RACKET

Stanley C. Plagenhoef, Amherst, Mass., assignor to Motion Analysis, Inc., Amherst, Mass.

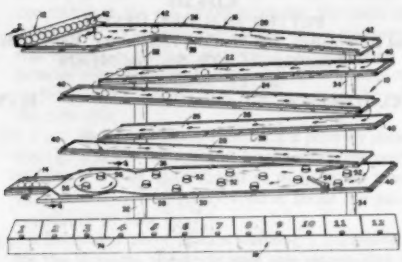
Filed Jun. 3, 1977, Ser. No. 803,128
Int. Cl.[2] A63B *49/04*
U.S. Cl. 273—73 C **9 Claims**

1. In a game racket having at least a head portion with a top, bottom and two sides and a handle portion the improvement comprising,
side weight means located at one side only of the head portion for reducing the strain on the anatomy of the arm when a player makes an off-center hit with the side weight means up when the hit occurs,
and handle weight means located in said handle portion and coacting with said side weight means for establishing the center of gravity of said game racket at a point closer to the end of the handle portion than to the tip of the head portion and a center of percussion relative to a center of

rotation in said handle portion located between the tip of the head portion and the midline of the head portion for

reducing the strain on the anatomy of the arm when an off-center hit occurs on the tip side of the head midline.

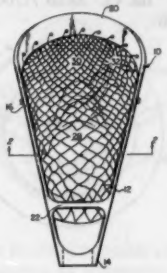
4,153,250
GRAVITY-TYPE RACING GAME
Zacharias Anthony, 181 Atlantic Ave., Long Branch, N.J. 07740
Filed Mar. 13, 1978, Ser. No. 885,760
Int. Cl.[2] A63F *9/14*
U.S. Cl. 273—86 C **11 Claims**



1. A gravity-type racing game, comprising:
a start position and a finish position, an inclined trackway connecting said start and finish positions,
a plurality of playing objects assignable to a plurality of players;
means for simultaneously releasing said playing objects from said start position to traverse said inclined trackway toward said finish position,
means disposed on said inclined trackway for movement on said inclined trackway for deflecting said playing objects away from said finish position, and
a plurality of control means each operable by a player for actuating said same movable deflecting means so that any player may actuate said same deflecting means to deflect the playing object of another player away from said finish position.

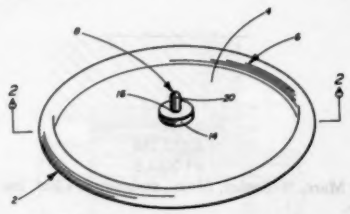
4,153,251
LACROSSE STICK MESH
Robert B. Pond, Rte. #1, Taneytown, Md. 21787
Filed Nov. 16, 1976, Ser. No. 742,199
Int. Cl.[2] A63B *59/02, 51/00*
U.S. Cl. 273—96 D **4 Claims**

1. One lacrosse stick having a handle with a longitudinal axis and a head adapted to be secured to the handle, comprising a generally V-shaped frame covered by a net, the frame being defined by two side walls which diverge from a junction, a transverse wall joining the opposite end of the side walls, and a transverse stop spaced from the junction which joins the side walls; the improvement wherein said net comprises:
a flexible web of a non-plastically deformable material containing preformed regions for facilitating catching and throwing with the lacrosse stick, the catching region



being an area centered on the extended longitudinal axis of the handle, said region having at least its side and top boundaries defined by preformed interstices of first sizes with its center portion containing preformed interstices of larger size than said first sizes, the size of the preformd interstices as measured by their perimeters becoming progressively larger as their distance from the boundaries toward the center portion increases.

4,153,252
AERODYNAMIC DISC
Richard A. Sullivan, P.O. Box 6, East Rutherford, N.J. 07073
Filed Oct. 31, 1977, Ser. No. 847,072
Int. Cl.[2] A63H *33/18*
U.S. Cl. 273—106 B **7 Claims**



1. An aerodynamic disc-shaped object, comprising:
a disc having periphery thereto;
an outer rim section attached to the periphery of said disc; and
a central section disposed within the center of said disc, said central section comprising a central axis of rotation, said central section additionally comprising a substantial amount of the total weight of said disc-shaped object for increasing the rotational spin of said object.

4,153,253

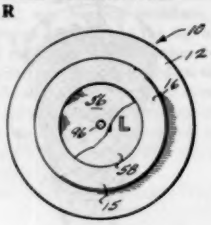
ROAD HOCKEY PUCK

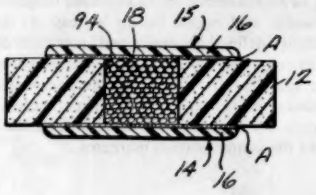
Thomas P. White, Sr., 159 King St., East, Saint John, New Brunswick, Canada (E2L 1G9)

Division of Ser. No. 723,642, Sep. 15, 1976, Pat. No. 4,078,801, which is a continuation-in-part of Ser. No. 320,176, Jan. 2, 1973, Pat. No. 3,997,164, which is a continuation of Ser. No. 51,310, Jun. 30, 1970, abandoned. This application Jan. 11, 1978, Ser. No. 868,542

Int. Cl.[2] A63B *71/00*

U.S. Cl. 273—128 R **7 Claims**





1. A puck for playing road hockey, comprising:

a generally cylindrical main body of foam rubber, having two opposite ends with an outer peripheral sidewall extending therebetween;

two disks of plastic material, each being substantially thinner, of lesser diameter and more dense and rigid than the main body;

adhesive means securing each disk facewise coaxially upon a respective end of the main body;

said puck weighing between 110 grams and 170.1 grams so that it has a weight on the order of that of conventional ice hockey pucks, which weigh 6 ounces (170.1 grams).

4,153,254

PUZZLE

Michel Marc, Wellesley, Mass., assignor to Clint, Inc., Natick, Mass.

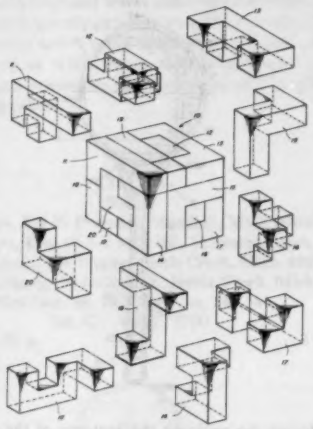
Filed Aug. 22, 1977, Ser. No. 826,356

Int. Cl.[2] A63F *9/12*

U.S. Cl. 273—160 **7 Claims**

1. A three dimensional puzzle game comprising:

a plurality of component pieces, each of said component pieces being unique from each other and being configured to form a polyhedron having a quantity of horizontal surfaces and a quantity of vertical surfaces each greater than two so that assembly of a first quantity, a second quantity and a third quantity of said component pieces each forming a solid having six surfaces, said first, second and third quantities of said component pieces each having



only one combination of said component pieces to form said six surface solid.

4,153,255

PUTTER TRAINING DEVICE

Leland B. Woodson, 108 W. 12th, Hutchinson, Kans. 67501

Filed Nov. 15, 1976, Ser. No. 741,629

Int. Cl.[2] A63B *69/36*

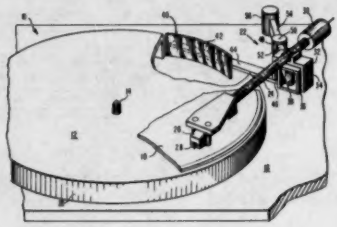
U.S. Cl. 273—186 A **10 Claims**

1. A training aid for golfers for improving their putting stroke by urging linearity of movement of the putter head in the vertical plane as it moves to contact a golf ball, said aid comprising a green simulating means defining a horizontal putting surface, and the provision of coacting first and second guide means respectively adapted to be carried by a putter head and mounted on the green simulating means, said second guide means including an elongated and flexible guide element of substantially cylindrical transverse section, spaced support means secured to the green simulating means for supporting the opposite ends of said element with the latter extending freely therebetween in spaced relation above the putting surface, resilient means for yieldingly maintaining said element under tension in its extent between the support means, said element being slidingly engageable by the first guide means and operative during such sliding engagement to yieldingly oppose departure of the first guide means from a path having a straight projection on a horizontal plane.

4,153,256
TANGENTIAL TRACKING TONEARM

Dwipendra N. Guha, Calcutta, India, assignor to Avnet, Inc., New York, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,481
Int. Cl.[2] G11B 3/28
U.S. Cl. 274—23 A 4 Claims



1. A record player for playing grooved disc records on a rotating turntable comprising:

(a) a circular-shaped rotatable turntable of a predetermined radius having a peripheral edge and mounted for rotation about a central axis;

(b) a base plate for supporting such a turntable; and

(c) a tonearm system mounted on said base plate, said tonearm system comprising:

(i) a tonearm having a tonearm axis, a stylus at one end of said tonearm and a counterweight at the other end of the tonearm;

(ii) a guide means which comprises an arc of a circular-shaped rim element having a predetermined outer radii surface greater than the radius of the turntable and concentric to the axis of the turntable, the outer radius being equal to the effective length of the tonearm, the rim element positioned in a slightly spaced-apart relationship from and adjacent to the peripheral edge of the turntable and mounted to be concentric to the axis of the turntable;

(iii) a movable pivot bracket defining a primary movable vertical axis for the tonearm intermediate the one and the other end of the tonearm to provide the tonearm with pivotal horizontal movement about the primary vertical pivot axis;

(iv) a horizontal pivot bracket defining a horizontal axis for the tonearm, the horizontal axis intersecting with the movable primary vertical pivot axis to provide the tonearm with vertical pivotal movement about the horizontal pivot axis;

(v) a secondary, fixed, vertical pivot support means defining a fixed vertical pivot axis;

(vi) extending-arm-connection means connecting the secondary, fixed, vertical pivot axis with the primary movable vertical pivot axis;

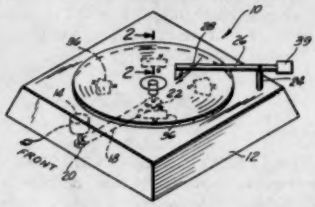
(vii) a guide-lever means having a straight edge for contacting the outer radii surface of the guide means; the guide-lever means extending through the primary movable vertical axis and secured at an angle of ninety degrees (90°) to the tonearm axis, the straight edge extending toward and overlapping the outer edge of the guide means and in contact with the outer radii surface of the guide means; and

(viii) whereby the frictional forces about the secondary, fixed, vertical pivot axis are the greater than the frictional forces about the primary, movable, vertical pivot axis so as to provide for continuous contact of the straight edge of the guide-lever means with the outer surface of the guide means, whereby, on operation of the turntable, the tonearm and stylus are maintained at all times in a tangential relationship.

4,153,257
RECORD STAMPER PLAYBACK TURNTABLE

Roland C. Wittenberg, New Hyde Park; George Alexandrovich, Commack, and Frank J. Frielingsdorf, Port Jefferson, all of N.Y., assignors to Pickering & Company, Inc., Plainview, N.Y.

Filed Oct. 11, 1977, Ser. No. 842,180
Int. Cl.[2] G11B 3/60
U.S. Cl. 274—39 R 6 Claims

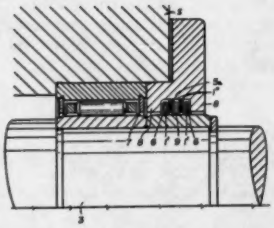


1. A record stamper playback turntable comprising: a base, a stamper platform supported for rotation to said base, a motor and drive system connected to said platform for rotating said platform in a counterclockwise direction, said drive system being such as to slip to permit platform stoppage and reverse rotation under the influence of manual pressure applied to said platform without damaging said platform so that a defect in said stamper may be located and reciprocating movement of said turntable by hand may be used to replay the defective portion a tone arm support extending from said base, a tone arm having one end pivotally attached to said support opposite from a conventional tone arm mounting and a free end, a cartridge affixed to said tone arm free end, a stylus affixed to said cartridge, said stylus having a stamper ridge tracking configuration, said tone arm being mounted to said base so as to permit said stylus to track the ridges of a stamper rotating counterclockwise on said platform and means on said platform for securing a stamper flat against said platform.

4,153,258
PACKING SEAL

Wolfgang Hüber, Schweinfurt, and Anton Marx, Sulzthal, both of Fed. Rep. of Germany, assignors to SKF Industrial Trading and Development Company, Amsterdam, Netherlands

Division of Ser. No. 365,449, May 31, 1973, Pat. No. 3,917,288.
This application Aug. 18, 1975, Ser. No. 605,508
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1972, 2227374
Int. Cl.[2] F16J 15/44
U.S. Cl. 277—56 4 Claims



1. Seal means for closing the space between a rotating shaft and a stationary surrounding housing having an annular slot formed in the inner surface of said housing, comprising a plurality of annular discs located in said slot, said discs being spaced from each other to allow fluid media therebetween, alternating ones of said discs being tensioned radially on said

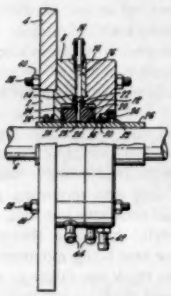
shaft and on said housing respectively and being spaced from the respectively opposed surfaces of said shaft and housing, at least one face of each of said discs lying in spaced opposition to its adjacent disc having arcuate grooves comprising spiral sections uniformly spaced about the face of said disc parallel to each other, each of said sections extending curvedly in the same direction with respect to the direction of rotation of said shaft from the inner edge to the outer edge of said disc and open thereout, said arcuate grooves generating a centripetal flow creating pressure in said fluid medium between the frontal faces of the adjacent discs and the frontal face of the slot and the opposing faces of its adjacent discs, on rotation of said shaft.

4,153,259

SHAFT SEALING ARRANGEMENT

Tommy Torstensson, Forsheda, Sweden, assignor to Forsheda Gummifabrik AB, Forsheda, Sweden

Filed Feb. 28, 1977, Ser. No. 772,866
Int. Cl.[2] F16J *15/40*
U.S. Cl. 277—75 **7 Claims**



1. A seal device for sealing an annular space between a machine element and a shaft rotatable in relation thereto, comprising a housing having an opening therein and an annular chamber surrounding and being at its inner periphery in open connection with said opening, an annular sealing element of an elastic material mounted in said chamber and sealingly engaging the walls thereof, a sleeve in said opening, said sealing element enclosing and sealingly engaging said sleeve, means for supplying to the opposed surfaces of said sealing element and said sleeve a fluid under pressure for expanding said sealing element and thereby separating said surfaces in order to establish a clearance space between said surfaces in the operational condition of the seal device, and means for sealingly connecting said housing with the machine element in a position where the shaft projects into said sleeve, the sleeve being adapted thereby sealingly to enclose the shaft.

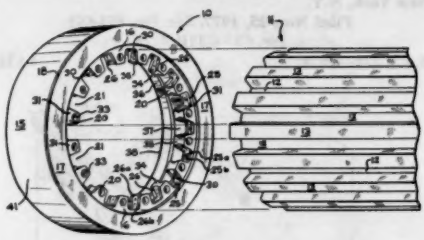
4,153,260

SLIP SPLINE SEAL ASSEMBLY

Robert G. Joyner, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Jun. 2, 1978, Ser. No. 911,927
Int. Cl.[2] F16J *15/56*
U.S. Cl. 277—181 **8 Claims**

1. A slip spline seal assembly for shafts having alternating longitudinal grooves and ribs, said assembly comprising a flexible body having a row of alternating projections and intervals for splined and sealing engagement with such grooves and ribs, said intervals having a base and lying intermediate opposing faces of said projections, and at least one recess defined in said base or said faces providing a pocket for lubri-



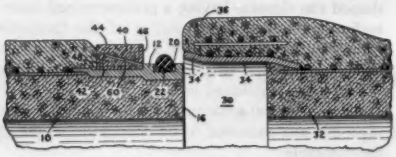
cating medium and a relief for displacement of said flexible body when compressed.

4,153,261

POLYURETHANE FOAM BODY WITH ALKALINE SUBSTANCE SUSPENDED THEREIN FOR PROTECTING PIPE JOINTS OF SMALL-DIAMETER PIPES

John S. McLeod, McBee, S.C., assignor to Interpace Corporation, Parsippany, N.J.

Filed Apr. 25, 1977, Ser. No. 790,476
Int. Cl.[2] F16J *15/10*
U.S. Cl. 277—205 **4 Claims**



1. In a structural polyurethane foam system having an alkaline substance suspended therein for protecting the pipe joint of two interconnecting bell and spigot pipes, said system comprising

a solid member having an inner surface for engagement with the spigot end of a first pipe,

an outer surface for partial engagement with the bell end of a second pipe when the second pipe telescopingly receives therein said spigot end of the first pipe to form a pipe joint,

a front surface for partial engagement with an end face of said bell ring of the second pipe when the first and second pipes are interconnected, and

a rear surface for partial engagement with a spigot shoulder of the first pipe,

wherein the improvement comprises:

means for decreasing the resilient forces of said solid member so that when the first and second pipes are interconnected to form a joint the force urging the second pipe away from the first pipe is small enough to prevent separation of the two pipes,

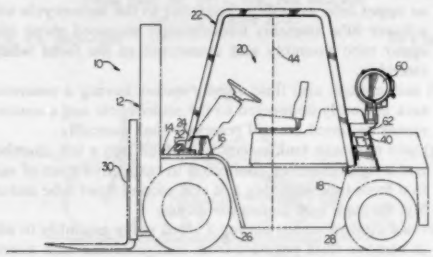
said means for decreasing the resilient forces comprising a slit formed in said solid member, said slit extending from said front surface rearwardly toward said rear surface and terminating at a distance from said rear surface to form two portions for said solid member constituted by an outer portion radially outwards of the slit and an inner portion radially inwards of the slit, the position of the slit being such that when the pipes are interconnected, said outer portion is buckled by contact with the bell end of the second pipe while the inner portion remains substantially intact on said spigot end.

4,153,262

LIFTING EYE AND OVERHEAD GUARD MOUNTING ARRANGEMENT

Jack Diamond, Chesterland; Neil J. Shipley, Eastlake, and John C. Smith, Mentor, all of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Feb. 24, 1977, Ser. No. 771,607
Int. Cl.[2] B60K *15/00*; B60R *21/02*
U.S. Cl. 280—5 A **8 Claims**



3. In a lift truck, an improvement comprising:
first eye means adjacent a front end of said truck supported by a frame thereof;
a pair of bracket means adjacent a rear end of said truck supported by said truck frame, one adjacent each side of said truck;
beam means for connecting each of said bracket means to one another to form said pair of bracket means into an integral unit;
second eye means formed by said bracket means, said first and second eye means being substantially spaced from the center of gravity of said truck; and
overhead guard means supported at a rear end thereof by said pair of bracket means and at a front end thereof by said truck frame.

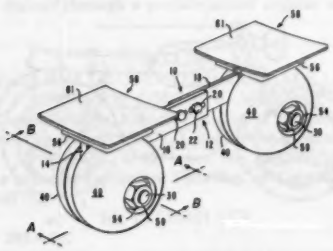
5. An improvement as in claim 3, including:
auxiliary fuel tank means supported by said pair of bracket means.

4,153,263

BALL SKATE

Koichi Yoshimoto, #3-15-310, Takaodori, 4-chome, Nata-ku, Kobe, Japan

Filed Dec. 9, 1977, Ser. No. 859,174
Claims priority, application Rep. of Korea, Jun. 22, 1977, 77-4064
Int. Cl.[2] A63C *17/24*
U.S. Cl. 280—11.1 BR **10 Claims**



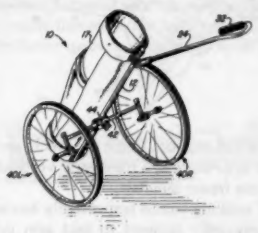
1. A ball skate comprising:
a support member including an elongated body portion having pedestals depending therefrom at each end;
a pair of like axles mounted one in each of said pedestals at the outer ends thereof, each axle having a bearing portion at each end;
two pairs of opposed hemispherical rollers each roller being rotatably mounted through its axis normal to its planar surface on a respective one of said bearing portions;
said bearing portions being inclined away from said body portion at an angle providing substantially tangential relationship between the rollers at the point farthest from the body portion as to rollers mounted on the same axle to form a ball-like surface; and
at least one platform mounted on said body portion on the side thereof opposite said rollers.

4,153,264

GOLF CART

William J. Pfister, 1136 Outwest, Prescott, Ariz. 96301

Filed Dec. 15, 1977, Ser. No. 860,843
Int. Cl.[2] B62B *1/12*
U.S. Cl. 280—38 **4 Claims**



1. A cart for the manual transportation of a golf bag comprising:
(a) a main frame member having fastener means associated therewith for securing the frame to a golf bag;
(b) clamp means secured to said main frame member at a generally intermediate position along said frame;
(c) a pair of cross frame members each having first and second ends, said first ends being detachably securable in a position of use at said clamp member and said cross frame members being in a generally transverse position to said main frame member in said position of use;
(d) a pair of wheels rotatable about an axle disposed at opposite sides of said frame member supported on the second ends of said cross frame members; and
(e) attachment means interconnecting said wheel axles and said cross frame members, each of said attachment means comprising:
(i) a generally vertical tube extending between the second end of said cross members and said wheel axles; and
(ii) pivot means associated therewith having first and second positions whereby said cross frame member can be positioned substantially parallel to said wheel axle in a first position and secured to said clamp means at said first end in a position of use and whereby said cross frame member can be detached from said main frame and said cross frame pivoted to a position generally perpendicular to said axle along side the wheel in a second position in a storage position.

4,153,265

OFF-ROAD VEHICLE

Bruce J. McColl, Whitby, Canada, assignor to Owens-Illinois, Inc., Toledo, Ohio

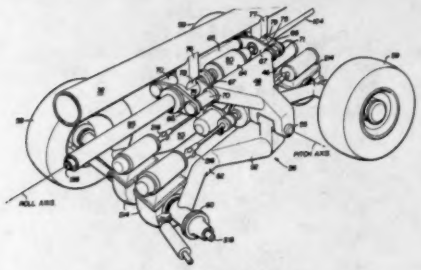
Continuation of Ser. No. 584,078, Jun. 5, 1975, abandoned. This application Oct. 17, 1977, Ser. No. 842,801
Int. Cl.[2] B60G *19/10*; B62D *61/10*
U.S. Cl. 280—112A **5 Claims**

1. For use in a self-propelled off-road vehicle having an elongated main frame element extending the length of the

vehicle and at least one casing containing power transmission elements secured to said main frame element in depending relationship thereto, the improvement comprising a high mobility mounting mechanism for four wheels separately driven from said tranmission elements consisting of:

(1) a rigid support frame formed with a central aperture therein surrounding said transmission case and having opposed laterally projecting arm portions;

means for pivotally mounting the central portion of said support frame to said main frame in depending relationship thereto for movement about a horizontal roll axis that is parallel to and below said main frame, whereby said arm



portions of the support frame are freely movable concurrently but oppositely in a transverse vertical plane relative to said main frame member;

(2) a pair of walking beams respectively having their medial portions pivotally secured to said arm portions of said rigid frame for movements in vertical planes respectively parallel to said roll axis;

(3) a ground engaging wheel both steerably and rotatably mounted on each end of each walking beam member; and

(4) power transmission means continuously interconnecting each said wheel with said power transmission elements contained in said casing.

4,153,266

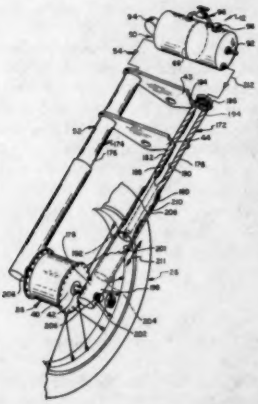
AIR SHOCK APPARATUS FOR MOTORCYCLES

Jimmie J. Uhls, Rte. 1, Elgin, Kans. 67361

Filed Dec. 5, 1977, Ser. No. 857,221

Int. Cl.[2] B62K *25/08*

U.S. Cl. 280—276 **3 Claims**



1. An air shock apparatus adapted to provide a cushioned shock absorbing ride to the front wheel assembly of a motorcycle, comprising:

(a) a control and fluid supply means mounted on the motorcycle holding a supply of air under pressure;

(b) a front fork support means mounted to and between the motorcycle and the front wheel assembly;

(c) a connector means connected to said control and fluid supply means and said front fork support means to convey said air under pressure therebetween;

(d) said front fork support means having a pair of parallel first and second front tube assemblies;

(e) each of said first and second front tube assemblies having an upper tube assembly connected to the motorcycle and a lower tube assembly telescopingly mounted about said upper tube assembly and connected to the front wheel assembly,

(f) said control and fluid supply means having a reservoir tank assembly connected to the motorcycle and a control means mounted on said reservoir tank assembly;

(g) said reservoir tank assembly divided into a left chamber and a right chamber connected to respective ones of said first front tube assembly and said second front tube assembly; through said connector means;

(h) said control means having a bleed valve assembly to add or remove fluid pressure from said reservoir tank assembly,

(i) said control means having a fluid equalizer assembly connected to said reservoir tank assembly to regulate fluid pressure between said left chamber and said right chamber;

(j) said fluid equalizer assembly including a conduit member mounted between said right chamber and said left chamber and a valve member mounted in said conduit member;

(k) said valve member operable to be opened and closed to equalize fluid pressure between said left chamber and said right chamber; and

(l) said control means includes a pump assembly mounted in one of said chambers and having a reciprocating piston plunger assembly to receive atmospheric air from outside said reservoir tank assembly and pump said atmospheric air under pressure into said reservoir tank assembly, whereby said upper tube assembly and said lower tube assembly are movable relative to each other under cushion of said air pressure in said control and fluid supply means.

4,153,267

WHEELS FOR LAND VEHICLES SUCH AS MOTORCYCLES

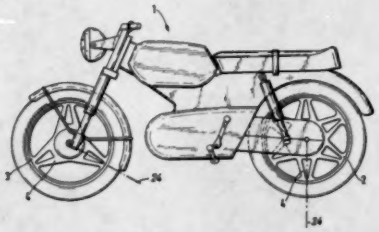
Johann Hilber, Hochberg, Fed. Rep. of Germany, assignor to Kreidler Werke GmbH, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 831,041

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640843

Int. Cl.[2] B62K *11/02*; B60B *1/14*

U.S. Cl. 280—281 R **13 Claims**



13. In a wheel for a land vehicle, the combination comprising a hub, spokes, and a rim, said hub being formed with a circumferential groove while the spokes extend into said groove with a close fit, said spokes having inner end regions situated in said groove, and the inner end regions of adjacent

spokes partially overlapping each other and fasteners fastening said spokes to said hub and extending through the overlapping parts of said spokes.

4,153,268

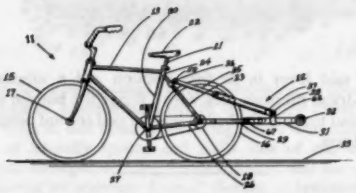
CYCLE STABILIZING ACCESSORY

Thomas A. Wilson, 310 Thomas St., Roxana, Ill. 62084, and Hallie W. Baxter, 605 Whittier, Wood River, Ill. 62095

Filed Dec. 30, 1977, Ser. No. 865,978

Int. Cl.[2] B62K *5/00*

U.S. Cl. 280—296 **10 Claims**



1. For use with a bicycle having a front wheel and a rear wheel, a seat, and a frame carrying said wheels and supporting said seat, said bicycle being rearwardly rotatable about an axis extending through the rear wheel axle by raising the front wheel from the surface upon which the bicycle is located, stabilizing apparatus for securement to said bicycle for stabilizing the bicycle upon rearward rotation thereof, said apparatus comprising a pair of elongated members of tubular character extending rearwardly of said bicycle, each said elongated member having a forward portion secured to said rear wheel axle in fixed angular relationship with respect to said frame, said elongated members extending on opposide sides of said rear wheel and each including spaced apart rear axle-remote portions, a stabilizing wheel axle carried transversely between said axle-remote portions, at least one stabilizing wheel carried by said stabilizing wheel axle, each said elongated member being adapted to provide selective adjustment of distance between said rear wheel axle and stabilizing wheel axle, at least one brace means interengaging each of said elongated members and said frame for bracing therebetween, said brace means comprising a plurality of tubular elements in mutually telescoping relationship and means for maintaining a selectively fixed telescoped configuration of said tubular elements to provide selective adjustment of length of said brace means, one of said tubular elements including an aperture at one end thereof proximate a tubular structure of said bicycle, a strap-like element for at least partly encircling said tubular structure, and means extending through said aperture for securing said strap-like element and said tubular element in pivot relationship, said stabilizing wheel being adapted to engage said surface at a point rearward of said bicycle upon said rearward rotation thereof through a predetermined angular extent.

4,153,269

HYDRAULICALLY OPERATED VARIABLE LENGTH TOP GUIDE COUPLING MEMBER

Wilhelm von Allwörden, Erbach, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

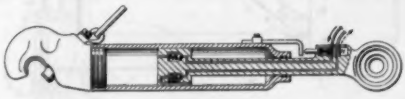
Filed Oct. 4, 1977, Ser. No. 839,298

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645752

Int. Cl.[2] B60D *1/04*

U.S. Cl. 280—482 **3 Claims**

1. A hydraulically operated variable length coupling member for use in three point linkage couplings for attaching agricultural implements to farm tractors comprising a cylinder, a main piston and piston rod carried for longitudinal movement within said cylinder for varying the length of said coupling member, articulation means carried at opposite ends of said coupling member, a first hydraulic line providing a first path of communication between a source of hydraulic fluid and a first space within said cylinder on one side of said main piston opposite said piston rod, a second hydraulic line providing a second path of communication between a source of hydraulic fluid and a second space within said cylinder on the side of said main piston having said piston rod, a first one-way valve in the path of communication between said first hydraulic line and said first cylinder space for closing said first path, a second one-way valve in the path of communication between said second hydraulic line and said second cylinder space for closing said second path, a control piston located between said first and second one-way valves for controlling the opening of said first and second one-way valves, whereby upon application of hydraulic pressure to said first hydraulic line said first one-way valve will be opened by the force of hydraulic pressure acting thereon to permit hydraulic fluid to flow into said first cylinder space to cause longitudinal movement of said main piston within said cylinder in a first direction, said hydraulic pressure in said first hydraulic line also acting on said control piston to cause movement thereof to open said second one-way valve to open communication between said second cylinder space and said second hydraulic line to permit hydraulic fluid to flow out of said second cylinder space, and whereby upon application of



hydraulic pressure to said second hydraulic line said second one-way valve will be opened by the force of hydraulic pressure acting thereon to permit hydraulic fluid to flow into said second cylinder space to cause longitudinal movement of said main piston within said cylinder in a second direction opposite to said first direction, said hydraulic pressure in said second hydraulic line also acting on said control piston to cause movement thereof to open said first one-way valve to open communication between said first cylinder space and said first hydraulic line to permit hydraulic fluid to flow out of said first cylinder space, means for immobilizting said main piston within said cylinder to fix the length of said coupling member to a desired length position, said first and second hydraulic lines having hydraulic pressure therein which is less than the pressure required for opening one of said one-way valves when said coupling member is in an immobilized condition, a control slide positioned in said first and second hydraulic lines between said source of hydraulic fluid and said first and second one-way valves, and an adjustable stop member for mechanically actuating said control slide to cause length adjustment of said coupling member for repeatable selection of a pre-selected length, whereby said first and second hydraulic lines are selectively connected with said source of hydraulic fluid upon actuation of said control slide by said stop member.

4,153,270

SLIDING HITCH-BALL HOLDER AND GUIDE RACK ASSEMBLY

Robert L. Brockmiller, R.R. #1, La Grange, Mo. 63448

Filed Jun. 9, 1978, Ser. No. 914,242

Int. Cl.[2] B60D *1/18*

U.S. Cl. 280—490 R **11 Claims**

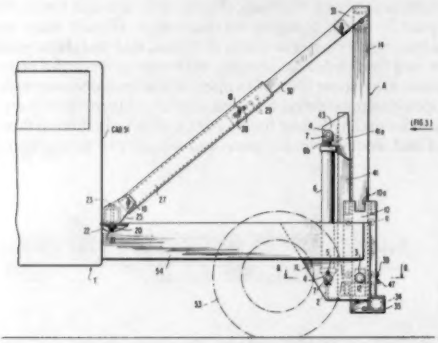
1. A tiltable sliding hitch-ball holder and guide rack assembly for coupling one end of a mobile home to a towing vehicle or the like for towing and lifting on-site, said vehicle having a generally horizontal frame, said assembly comprising:

paired laterally opposed generally vertical poles mounted at their lower ends to said frame for limited pivoting about a horizontal axis,

a carriage mounted to said vertical poles and extending therebetween for vertical movement on said poles,

a transport hitch-ball carried by said carriage for coupling to said home one end and projecting axially upwardly parallel to said generally vertical poles,

at least one hydraulic cylinder pivotably mounted at a lower end to said frame for pivoting about a horizontal axis parallel to and at generally the same height as the horizontal pivot axis for the lower ends of said vertical poles, having an upper end extendable with respect to its lower end, and having its upper end pivotably connected to said carriage, at its upper end, such that extension of said hydraulic cylinder causes said carriage and said hitch-ball to rise on said laterally opposed generally vertical poles, while permitting limited pivoting of said poles without interference by said hydraulic cylinder, and



at least one extensible telescoping beam assembly pivotably coupled at one end to said horizontal frame at a point spaced from said pivot mounting of said paired vertical poles, and at its other end to the upper ends of said laterally opposed generally vertical poles;

whereby, by extension or retraction of said telescoping beam assembly and locking of the same in given position, said hitch-ball, said carriage and said generally vertical poles can be oriented at true vertical regardless of the angle of inclination of said vehicle and said generally horizontal frame conforming to the slope upon which the vehicle rests, to insure that the end of said modular home coupled to said hitch-ball is raised along a true vertical path during placement of the home on a preformed, on-site foundation.

4,153,271

BINDING FOR CROSS-COUNTRY SKIING

Franz Büttner, deceased, late of Egg, Switzerland (by Raoul Imseng and Urs Widmer, as agents for Allgemeine Treuhand AG, Zurich, Switzerland, legal representatives), assignor to Kastle (Schweiz) AG, Heerbrugg, Switzerland

Filed Jan. 13, 1977, Ser. No. 759,246

Claims priority, application Switzerland, Jan. 16, 1976, 484/76

Int. Cl.[2] A63C *9/20*

U.S. Cl. 280—615 **13 Claims**

1. Binding for cross-country skiing comprising:

a base plate with side plates;

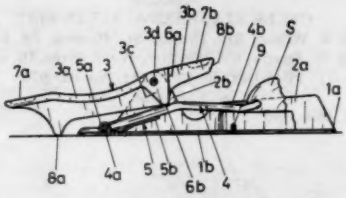
a bail pivotally mounted on said base plate, said bail being adapted to lock a boot-toe temporarily to the base plate;

a lever being pivotally mounted on an axis lying above the bail;

said lever including a cam protruding downwards which exerts a pressure onto said bail at a certain distance behind the pivotal mounting of said bail;

said lever cooperating with the bail so that after pivoting the lever upwards into a first position the bail is released and after pivoting the lever downwardly, passing a dead center, a second position of the lever is reached which pushes down the bail and thus locks the binding; and

said cam including a stopping plane which touches the bail



with said lever in its first position and a substantially cylindrical pressure area which forms the bottom of said cam and touches the bail at least in said second position of said lever.

4,153,272

TORSION ROD STABILIZER ASSEMBLIES FOR VEHICULAR STEERABLE FRONT WHEELS

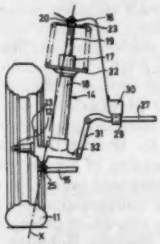
Kurt H. Fiedler, Geinsheim, and Adolf Draisbach, Kelsterbach, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 28, 1977, Ser. No. 819,878

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634915

Int. Cl.[2] B60G *19/00*

U.S. Cl. 280—689 **5 Claims**



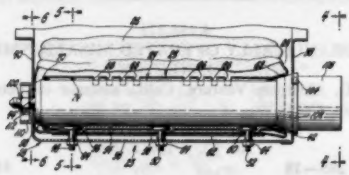
1. A torsion rod stabiliser assembly for a vehicle having a pair of front wheels mounted for steering movement relative to the vehicle superstructure, comprising a generally U-shaped torsion rod stabiliser having a central portion which extends transversely of the vehicle and is rotatably mounted on the vehicle superstructure, and end portions which form lever arms extending generally longitudinally of the vehicle, a pair of steering knuckles which are mounted for pivotal movement about respective steering axes and carry stub axles for the respective front wheels of the vehicle, and a pair of connecting links pivotally connected at the upper ends thereof to the respective lever arms rearwardly of the kingpin axis in the side view and pivotally connected at the lower ends thereof to the corresponding steering knuckles at articulation points which are offset from the respective steering axes at locations such that with the front wheels turned from a straight-ahead position, in addition to the restoring action of the stabiliser due to the differing relative vertical positions of the front wheels during cornering, the lever arm at the inside of the turn is moved downwardly by a force transmitted by way of the respective connecting link, and the lever arm at the outside of the turn is moved upwardly, in the sense of increasing the stabilising action of the stabiliser.

4,153,273

OCCUPANT RESTRAINT CUSHION SYSTEM

Richard C. Risko, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 14, 1978, Ser. No. 896,352
Int. Cl.[2] B62D 21/08
U.S. Cl. 280—740 4 Claims



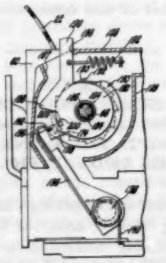
1. An occupant restraint system comprising, in combination, an elongated housing adapted to be fixedly mounted on a motor vehicle, said housing including a base wall connected to a pair of laterally spaced end walls, one of said end walls having an enlarged opening formed therein and the other end wall having an aperture formed therein, a restraint cushion having a pair of laterally spaced side walls one of which is formed with a hole, an elongated tubular diffuser located within said restraint cushion and being positioned in the housing between the end walls, one end of said diffuser being formed with a radially outwardly flared conical portion axially aligned with said hole in said restraint cushion, means radially extending from said diffuser and passing through the restraint cushion for rigidly connecting the diffuser to said base wall so as to locate said conical portion of said diffuser concentrically and in spaced relationship with respect to said enlarged opening in said one of said end walls, a gas generator positioned in said tubular diffuser, said gas generator having a threaded stud at one end thereof that extends through the other of said side walls of said restraint cushion and through said aperture in said other end wall of said housing, a conical flange formed at the other end of said gas generator and being located in said hole in the restraint cushion, and a nut on the threaded stud which upon tightening causes the conical flange to be drawn towards and cooperate with said conical portion of the diffuser for clamping the material of the restraint cushion surrounding said hole between said conical flange and said conical portion and providing a seal therebetween.

4,153,274

WINDING PREVENTION BELT RETRACTOR FOR PASSIVE SHOULDER BELT SYSTEM

Lloyd W. Rogers, Jr., Utica, and Edwin H. Klove, Jr., Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1977, Ser. No. 864,270
Int. Cl.[2] B60R 21/02
U.S. Cl. 280—745 5 Claims



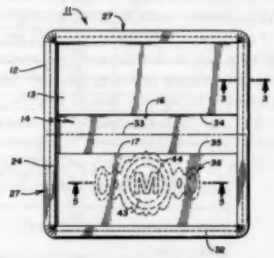
1. In combination, an automotive vehicle having a door, an occupant seat, a restraint belt for restraining the occupant in the seat, a reel having the belt wound thereon, a winding spring urging reel winding rotation to retract the belt to a stored position on the reel and pull the belt taut against the occupant, a locking mechanism effective to prevent belt extension only in response to a sensed acceleration condition a pawl and ratchet associated with the reel, a reel driven control means operative in response to a predetermined sequence and extent of reel rotation to control movement of the pawl between retraction permitting disengagement with the ratchet and retraction preventing engagement with the ratchet to hold the belt extended at a set length with respect to the seat, means normally establishing the pawl in the disengaged position irrespective of operation of the reel driven control means to a condition otherwise engaging the pawl with the ratchet, manual control means being manually actuatable by the occupant independently of occupant movement of the door and belt to establish the pawl in a condition for control by the reel driven control means, said reel driven control means being effective to disengage the pawl in response to predetermined unwinding rotation of the reel subsequent to engagement of the pawl and return the pawl to the normal disengaged condition to permit subsequent belt winding and unwinding rotation irrespective of the condition of the reel driven control means and until a subsequent actuation of the manual control means by the occupant.

4,153,275

CHECKBOOK COVER

John W. Phillips, Arden Hills, Minn., assignor to Deluxe Check Printers, Inc., St. Paul, Minn.

Filed Jul. 31, 1978, Ser. No. 929,303
Int. Cl.[2] B42D 3/08
U.S. Cl. 281—17 10 Claims



1. A simulated leather checkbook cover comprising a leather-like outer sheet of heavy gauge expanded unsupported vinyl sheet material having a peripheral edge, and an inner pocket-forming sheet of vinyl material having a peripheral edge engaging the inner surface of the outer sheet close to the peripheral edge of the outer sheet, the outer peripheral edge of the outer sheet being turned inwardly over and around the entire peripheral edge of the inner sheet as part of a three-layer folded edge portion, the layers of said edge portion being secured to each other around the entire periphery of the cover by a heat and pressure sealed vinyl-to-vinyl bond and by a line of threaded stitching extending through all three layers inwardly of and close to the fold formed by the turned over edge.

4,153,276

BOOKBINDING PROCESS AND BINDING OBTAINED BY THIS PROCESS

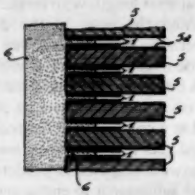
Jarl-Erik S. I. Ohlsson, St Julien en Genevois, France, assignor to Sisenca S.A., Geneve, Switzerland

Filed Oct. 13, 1977, Ser. No. 841,844

Claims priority, application Switzerland, Oct. 18, 1976, 13146/76

Int. Cl.[2] B42C 9/00

U.S. Cl. 281—21 R 7 Claims



1. A bookbinding process comprising applying adhesive along both sides of the folding lines of paper sheets, cutting, folding and assembling the sheets to form signatures, assembling a plurality of said signatures and trimming the dorsal part thereof so that the coated areas emerge on the dorsal edges of the pages, and gluing the thus-obtained assembly of signatures along said dorsal edges with bookbinding glue.

4,153,277

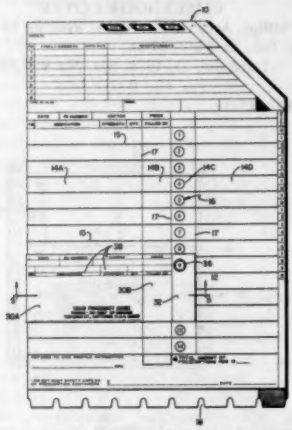
RECORD KEEPING SYSTEM

Gary J. Bellanca, Mount Sinai, N.Y., assignor to Wright Line Inc., Worcester, Mass.

Filed Feb. 24, 1978, Ser. No. 880,783

Int. Cl.[2] B41L 1/20

U.S. Cl. 282—9 R 9 Claims



1. A record keeping system comprising, in combination:

at least one master ledger sheet having a front and a back surface, the front surface being divided into a plurality of portions for receiving a like plurality of record keeping entries, said ledger sheet including indexing means corresponding to each of said portions; and

at least one label assembly comprising first and second sheets, registration means for cooperating with said indexing means and including a flap for cooperating with said ledger sheet so as to superimpose said first and second sheets over a select one of said portions of said ledger sheet, said first and second sheets being detachably secured to one another so as to maintain said sheets in a superimposed relationship, said assembly further including pressure responsive duplicating means for transferring information from said first sheet to said second sheet and to said ledger sheet, said flap being detachably secured to one edge of at least one of said sheets and including means for securing said flap to said back surface of said ledger sheet so as to maintain said registration means in registration with said indexing means.

4,153,278

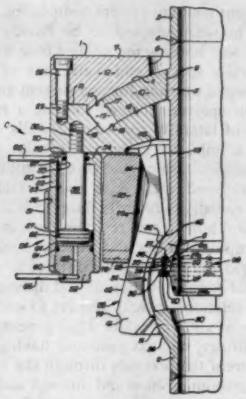
HYDRAULICALLY OPERATED MISALIGNMENT CONNECTOR

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.

Filed Sep. 19, 1977, Ser. No. 834,683

Int. Cl.[2] F16L 27/06

U.S. Cl. 285—18 41 Claims



1. In a misalignment connector: a body structure having a fluid opening and a first spherical sealing surface circumscribing said opening; a connector hub having a fluid opening and a second spherical sealing surface circumscribing said opening; an internal metal seal ring having an external spherical surface engaged with said first and second spherical sealing surfaces, with said seal ring circumferentially loaded therebetween; wedge means shiftable with respect to said connector hub; expansible and inwardly shiftable locking means operable by said wedge means for holding said body structure and said connector hub against separation; and remotely operable actuator means for shifting said wedge means between positions inwardly shifting said locking means and allowing expansion of said locking means; said locking means providing a spherical surface, said connector hub having an external spherical surface engaged by said spherical surface of said locking means and said connector hub being spaced from said body structure enabling misalignment of said connector hub and said body structure.

4,153,279

MOUNTING ASSEMBLY FOR A BRAKELINE TEE

William C. Blue, 16940 Edinburg Dr., South Bend, Ind. 46635

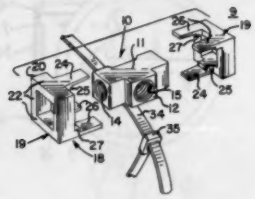
Filed Dec. 27, 1976, Ser. No. 754,349

Int. Cl.[2] B60D 1/08; F16L 3/00

U.S. Cl. 285—62 3 Claims

1. A mounting assembly comprising a housing and a multiple outlet fitting having opposite ends, the fitting received in the housing and the assembly mountable on an axle of a vehicle, the housing comprising a pair of complementary members each having a base portion having an opening therein, each base portion having complementary side portions coextensive with each base portion on opposite sides thereof, the comple-

mentary side portions of each member cooperatively engaging to form a pair of opposite side walls of the assembled housing when the members are joined, the base portion of respective members providing opposite end portions of the housing and each having said opening therein to receive respective end portions of the fitting, the pair of opposite side walls connecting the end portions of the housing and providing opposite open faces adjacent opposite side walls thereof, respective step



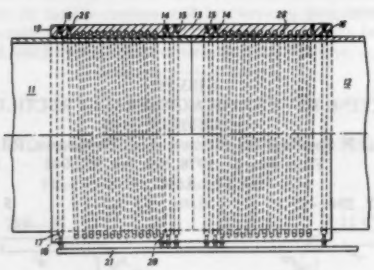
portions provided in the side portions of each complementary member to provide step portions in the side walls of the assembled housing adjacent opposite end portions thereof, a protruding side portion of the fitting received in one of the open faces of the housing to provide access thereto, the fitting overlying each step portion of the housing to form a groove between the fitting and the housing at each side wall, and a fastening means receivable in one of the grooves provided to secure the mounting assembly to the axle of a vehicle.

4,153,280

PIPE COUPLINGS

Thomas W. Bunyan, London, England, assignor to Pilgrim Engineering Developments Limited, London, England

Filed Feb. 23, 1977, Ser. No. 771,093
Int. Cl.[2] F16L *21/08*
U.S. Cl. 285—97 **6 Claims**



1. A pipe coupling comprising:

a sleeve formed in two parts separated along a longitudinal plane through the axis of the sleeve and including means for securing the two parts together;

means associated with the sleeve for sealing the sleeve against the pipe, said sealing means comprising an annular groove, an annular tire in said groove, and bores in the wall of the sleeve through which the interior of the annular tire communicates with the exterior;

gripping means associated with the sleeve for gripping the pipe, said gripping means comprising arcuate groove sections on the inside of the sleeve and formed by a continuous sinuous groove with groove sections extending from one longitudinal edge of each part of the sleeve to the other, the groove sections being connected alternately at opposite longitudinal edges by semi-circular sections, jaw sectors with gripping teeth acommmodated in the arcuate groove section, a tubular member or members located in the groove sections behind the jaw sectors, the tubular member being formed as a continuous tube in each part of the sleeve, and bores extending through the wall of the sleeve through which the interior of the tubular member communicates with the exterior;

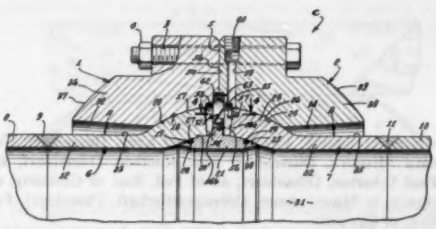
whereby the annular tire and the tubular member or members can be filled through the bores with a hardenable composition and maintained under pressure until set to force the sealing member into sealing contact against the outer surface of the pipe and to cause the gripping teeth of the jaw sectors to bite into the outer surface of the pipe.

4,153,281

MISALIGNMENT CONNECTOR WITH RETAINED INTERNAL SPHERICAL SEAL

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.

Filed Aug. 12, 1977, Ser. No. 823,919
Int. Cl.[2] F16L *27/06*
U.S. Cl. 285—167 **23 Claims**



1. In a misalignment connector; a pair of metal connector members each having an internal spherical sealing surface; and a fluid passage therein; a metal seal ring having external spherical surfaces engaged by the sealing surfaces of said connector members for confining fluid in said passages; constraining means holding said connector members together over a range of angular misalignment; and retainer means initially supporting said metal seal ring in a position with respect to one of said connector members for engagement of said spherical surfaces of said metal seal ring and enabling angular movement of said metal seal ring relative to said connector members when said connector members are constrained together; said constraining means and said connector members providing additional spherical surfaces enabling the make up of said connector over a range of angles of misalignment.

4,153,282

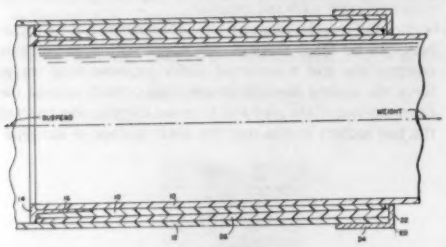
CONED JOINT FOR JOINING DISSIMILAR DIAMETER FILAMENT WOUND TUBES

Glen A. Clodfelter, Madison, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 794,329, May 5, 1977, Pat. No. 4,108,700. This application Feb. 27, 1978, Ser. No. 881,976
Int. Cl.[2] F16L *21/06*; F41F *3/04*
U.S. Cl. 285—332.3 **2 Claims**

1. A coned joint for joining two filament wound tubes having dissimilar diameters comprising: a step face ring for attachment to the mating end of the smaller diameter tube; means for attaching said ring to said tube; a joint ring for attachment to the mating end of the larger diameter tube; a taper joint ring

disposed between said tubes and being adhesively joined externally to the interior of said larger diameter tube and adhesively



joined interiorly to the tapered exterior of said smaller diameter tube to join the two tubes together.

4,153,283

CASING JOINT

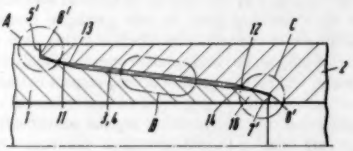
Wolfgang Hellmund, Viersen; Gerhard Krug, Düsseldorf; Gerhard Missaire, Düsseldorf; Kurt Roether, Düsseldorf, and Paul Schatton, Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,619

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1976, 2641767

Int. Cl.[2] F16L *21/00*

U.S. Cl. 285—334 **3 Claims**



1. In a casing joint to be made up from a box member and a pin member, having complementary, tapered threads and wherein each member has an axial end face and a shoulder, the thread being between the end face and the shoulder, and wherein the end face of one member is conical, the shoulder of that one member being planar, the end face of the other member being planar and the shoulder of the other member being conical, and wherein the box and pin members have sealingly engaging surface portions located between the engaging threads and the conical shoulder and face, being in abutment when the joint is made up, the improvement comprising:

the one member having the conical end face spaced axially from its planar shoulder at a spacing larger than a spacing between the conical shoulder and the planar shoulder of the other member; and

the pitch diameter of the thread of the box member being larger than the pitch diameter of the thread of the pin member everywhere along the threads and upon abutment of the conical shoulder and face, the conical shoulder and face being oriented to cause the member having the conical end face to be forced radially towards the other member upon further threading.

4,153,284

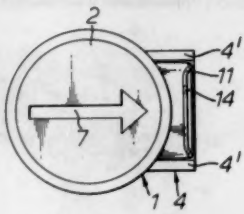
PAWL LATCH

Andrew C. W. Wright, Farnham, England, assignor to Dzus Fastener Co. Inc., West Islip, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,148

Int. Cl.[2] E05C *3/04*

U.S. Cl. 292—202 **7 Claims**



1. A pawl latch comprising a bush, said bush having a head, and a latching arm spaced axially from said head and extending in a direction transverse to the axis of said bush; said latch including at least one resilient leg, said leg being disposed on a side of said bush opposite said latching arm and extending back towards said head, said at least one resilient leg having a camming surface; said latch being adapted for insertion in an aperture in a panel at an angle, latching arm first, whereby said camming surface engages the side of said aperture, and whereby after said latch has been pushed into said aperture so that the underside of said head engages the face of said panel, the resilient leg, having been deflected on being pushed through said aperture, by engagement of said camming surface with said edge of said aperture, springs out resiliently to engage the rear face of said panel; said latch thereafter being maintained in position in said aperture on one side between said leg and said underside of said head and on the other side between said latching arm and said underside of said head.

4,153,285

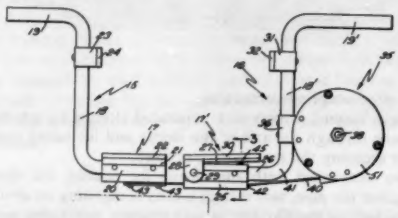
CARRYING DEVICE FOR A GENERALLY RECTILINEAR ARTICLE

Michael F. Sparling, 119 Ardmore Ave., Providence, R.I. 02908

Filed Jan. 25, 1978, Ser. No. 872,046

Int. Cl.[2] A61G *19/00*

U.S. Cl. 294—15 **5 Claims**



1. A carrying device for a generally rectilinear article comprising two units each comprising a body portion to engage the undersurface of the article to be carried, upstanding portions to engage the generally vertical sides of the article to be carried and handles extending outwardly from said upstanding portions, a reel of flexible material carried by one unit, said flexible material secured to said other unit and unreeling from said reel as said units are moved apart, and means on the unit carrying the reel to lock the flexible material against unreeling when the article to be carried rests upon the body portion of the unit carrying the reel.

4,153,286

TOOL FOR HANDLING HANGING PLANTS

John L. Piper, 1948 Meadow Dr., Springfield, Mo. 65804, and John R. Peterson, 778 W. Vest, Marshall, Mo. 65340

Filed Nov. 14, 1977, Ser. No. 851,368
Int. Cl.[2] A47F *13/06*
U.S. Cl. 294—19 R 3 Claims

1. A tool for handling a plant container of the type adapted to be suspended from an overhead bracket element by means of a bracket engaging member coupled with the plant container, said tool comprising:

a handle adapted to be gripped in the hand;

an elongate shaft secured to said handle in extension therefrom; and

a generally V shaped tip structure for receiving said bracket engaging member, said tip structure including a pair of substantially straight leg members cooperating to present the general shape of a V,

said tip structure being located on the end of said shaft remote from said handle such that one leg member of said tip structure is coupled with said shaft so as to form an acute angle therewith, and

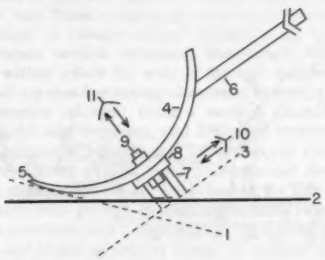
said leg members intersecting at a selected angle at the base of the V to form a sharp notch between said leg members sized to closely receive said bracket engaging member, whereby said bracket engaging member is closely held in said notch in engagement with each leg member.

4,153,287

SHOVEL BLADE

Marvin S. Towsend, 1365 Potomac Hts. Dr., Oxon Hill, Md. 20022

Filed Feb. 3, 1978, Ser. No. 874,816
Int. Cl.[2] A01B *1/20*
U.S. Cl. 294—51 11 Claims



1. An article of manufacture, comprising:

a. a handle;

b. a shovel blade having a leading edge and a trailing edge and having said handle rigidly attached to said trailing edge;

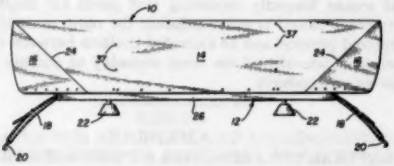
c. a bristle holder having semirigid bristles suitable for cutting ice rigidly attached to the underside of said shovel blade substantially parallel to the leading edge of said shovel blade and a suitable distance behind the leading edge of said shovel blade so that said semirigid bristles serve three distinct functions, first as a fulcrum for first class lever action between said handle and said leading edge of said shovel blade to control the height of said leading edge by changing the height of said handle, for scooping up the material being shovelled and avoiding surface irregularities, second, as an ice and snow scraper when said shovel blade is pushed along the surface to be cleared having said semirigid bristles in contact with the surface, and third, as an ice chopper when said shovel blade is raised and lowered substantially perpendicularly to the surface having the ice to be chopped, where the semirigid bristles serve as ice choppers.

4,153,288

FOLDING AIR DEFLECTOR

David C. Mueller, Aurora, Colo., assignor to Donna M. Mueller, Aurora, Colo.

Filed Sep. 26, 1977, Ser. No. 836,663
Int. Cl.[2] B62D *39/00*
U.S. Cl. 296—1 S 5 Claims



1. An improved vehicle air deflector assembly of the type having a framework with means thereon for connecting the framework to the top of a towing vehicle, and deflector means including both a central deflector of sheet material supported on said framework in a first position at an upward and rearward acute angle relative to the vehicle top and a pair of side deflectors depending from the opposite lateral sides of the central deflector in a deployed position, wherein the improvement comprises:

(a) said framework having a base frame and a superstructure with a pivotal attachment therebetween near the forward edge of the base frame, the superstructer being foldable along said pivotal attachment between said first position and a second folded position wherein the rear end of central deflector is lowered rearwardly until approximately parallel to the vehicle top;

(b) a support strut releasably connected between the base frame and superstructure near the rear ends thereof for selectively maintaining the framework in the first position;

(c) spacing means releasably connected between each of said side deflectors and the base frame for selectively holding each side deflector in deployed position when so connected and allowing the side deflectors to be folded under said central deflector when released from connection; and

(d) hinge means connecting the central deflector with the side deflectors for pivoting the side deflectors into a mutually inwardly folded position approximately parallel to the central deflector to reduce the effective size of the deflector means when the framework is in said second position.

4,153,289

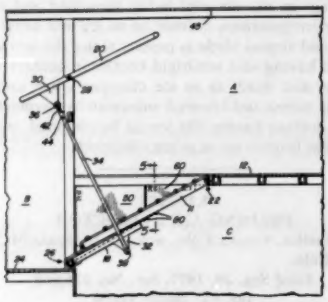
RAMP LEG GUARD

Mack A. Lewis, and Don A. Greive, both of Sioux City, Iowa, assignors to Wilson Trailer Company, Sioux City, Iowa

Filed Jun. 14, 1977, Ser. No. 806,492
Int. Cl.[2] B62D *33/04*
U.S. Cl. 296—24 C 11 Claims

1. In combination with a livestock trailer having two com-

partments respectively provided with floors at different vertical levels, and a ramp assembly pivotally connected to one of said floors for displacement between a retracted position blocking entry to one of the compartments and an operative position extending at an incline between the floors of said compartments to form a passageway therebetween; protective



means for said passageway including at least one guard panel, and means hingedly mounting said panel for displacement between a closed position adjacent the ramp assembly in the retracted position and an extended position between the compartments laterally of the ramp assembly to enclose the passageway thereabove.

4,153,290

LATERAL COVERING FOR A PASSENGER MOTOR VEHICLE

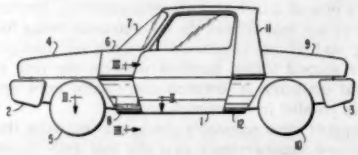
Bela Barenyi, Maichingen; Heinrich Haselmann, Sindelfingen, and Egon Rieth, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 560,819, Mar. 21, 1975. This application May 9, 1977, Ser. No. 794,705

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1974, 2414157

Int. Cl.[2] B62D *27/00*

U.S. Cl. 296—191 **33 Claims**



1. A lateral body covering structure for a vehicle having a frame, front and rear vehicle wheel casings, and at least one vehicle door opening located between said vehicle wheel casings, said covering structure comprising body covering means for covering the vehicle frame at lateral portions of the vehicle, wherein said body covering means includes separate independently detachable cover members extending only between the front and rear vehicle wheel casings and the respective intermediate vehicle door openings for covering the vehicle frame thereat, wherein each of said separate independently detachable cover members consits of a non-metallic panel member, wherein each of said panel members extends horizontally between the adjacent wheel casing and the adjacent door opening and extends vertically between the bottom edge of the vehicle and a plane extending horizontally approximately at the upper edge of the vehicle wheel casing, wherein a separating gap is formed between said independently detachable non-metallic cover members and an adjacent portion of said body covering means, said separating gap being covered by an elastic profile means, and wherein said independently detachable non-metallic cover members are fixedly secured in proximity of a lower edge to the vehicle frame at a predetermined separation distance therefrom by means of an elastic clip element.

4,153,291

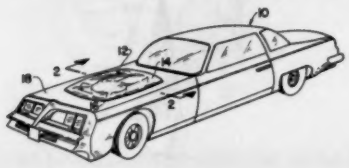
VIEWPORT ASSEMBLY

Nicholas R. Conti, 34 Young Ave., Hillside, N.J. 07205, and Robert Ferrara, 11 Preston Ave., East Hanover, N.J. 07936

Filed Mar. 23, 1978, Ser. No. 889,499

Int. Cl.[2] B60J *1/08*

U.S. Cl. 296—193 **11 Claims**



1. A viewport assembly for installation in the front or rear hood of a vehicle, said hood having an opening cut therein, said viewport assembly comprising:

a viewport having a central portion and a peripheral portion, said viewport being of a size larger than said hood opening so that the peripheral portion of said viewport overlaps the peripheral edge of said hood opening, the overlapping portion of said viewport having a tapered edge for engaging the uppersurface of said hood and for providing a smooth transition between said viewport and said hood;

said viewport assembly further including means for mounting said viewport within said hood opening, said mounting means including a mounting member extending in a direction substantially perpendicular to said viewport and extending from said viewport at a point between the peripheral portion and the central portion thereof; and

lip means connected to said mounting member and having a lip member for engaging the undersurface of said hood to securely fasten said viewport within said hood opening.

4,153,292

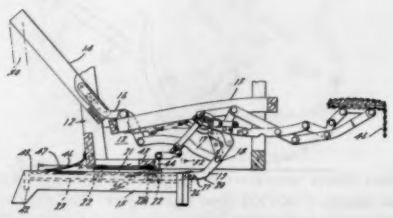
RECLINER CHAIR

David B. White; William Pacitti, and Edwin G. Gensler, all of Monroe, Mich., assignors to La-Z-Boy Chair Company, Monroe, Mich.

Filed Feb. 11, 1975, Ser. No. 548,892

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—83 **6 Claims**



1. In a reclining chair disposable adjacent to a wall and reclined thereat,

a chair frame,

a back frame,

a seat frame,

a platform,

a first link means for connecting said back frame to said seat

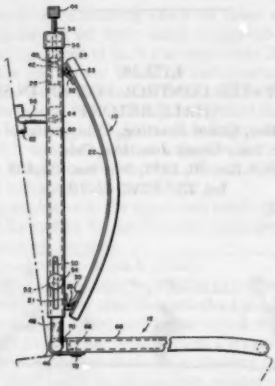
frame and said chair frame on both sides thereof permitting the back frame to recline and the seat frame to move relative to said back frame forwardly and upwardly, and a second link means, having arms connected to said first link means for moving the back, seat and chair frames simultaneously forwardly on said platform a predetermined distance of forward movement along with said arms of the second link means, so that said arms of said second link means move the same distance forwardly plus an additional distance forwardly as said back frame is being reclined.

4,153,293

BACK REST

Samuel B. Sheldon, Marblehead, Mass., assignor to Nepsco, Inc., Natick, Mass.

Filed Sep. 6, 1977, Ser. No. 830,386
Int. Cl.[2] A47C 7/46
U.S. Cl. 297—284 **6 Claims**



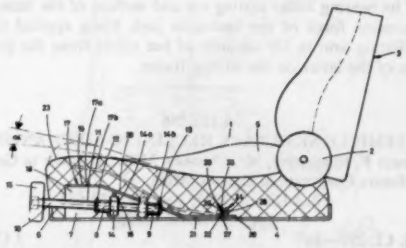
1. A back rest comprising a rigid frame adapted to be set upright on one end upon the bottom of a seat structure so as to rest against the back of the seat, a normally flat, flexible back support, means mounting the back support on the frame with one end stationary and the other end movable, means on the frame for moving the movable end relative to the stationary end to cause the normally flat, flexible back support to bow convexly forward relative to the frame and means for supporting the frame at different angular positions relative to the back of the seat, said frame comprising transversely-spaced parallel side members of channel-shaped section, a top member of channel-shaped section extending transversely of the side members within which the ends of the side members are received, said top member having closures at its ends, a U-shaped bottom member of right circular section extending transversely of the side members, said U-shaped bottom member having a horizontal portion parallel to the top member and transversely-spaced vertical parts perpendicular thereto telescopically engaged within the lower end of the side members, with the horizontal portion spaced downwardly from the ends of the side members, said top member being welded to the side members, and means adjustably fixing the vertical portions of the U-shaped bottom member to the side members, the means mounting the flexible back support to the frame comprising a bar of channel shape mounted at the top of the frame between the side members with its ends slidably engaged within the channels of the side members in parallel relation to the top member, a bar mounted at the bottom of the frame to the side members with its ends welded to said side members in parallel relation to the bottom member, transversely-spaced hooks fixed to the respective top and bottom bars mounted with their bent ends facing, said flexible back support comprising a flexible panel and means fixed to the opposite ends of the panel, said means extending in opposite directions into engagement with the said hooks, and said means for adjusting the convexity of the back support comprising a screw threaded into the top member provided at one end with a part rotatably engaged with the top bar and at its other end a knob by means of which it may be rotated to move the top bar relative to the bottom bar to thereby change the convexity of the back, said means for supporting the frame at different angular positions comprising side members slidingly engaged within the channels of the side members, a U-shaped rod mounted transversely in the slide members at the rear side of the frame with its ends pivotally connected to the slide members for rotation about a horizontal axis parallel to the top member to dispose it at an angle to the frame and means for fixing the slide members at a predetermined position in said side members.

4,153,294

APPARATUS FOR ADJUSTING THE INCLINATION OF SEAT UPHOLSTERY IN A DRIVER'S SEAT, OFFICE CHAIR, REVOLVING ARMCHAIR OR THE LIKE

Hermann Meiller, Amberg, and Otto Kunst, Michael-Poppenricht, both of Fed. Rep. of Germany, assignors to Messrs. Willibald Grammer, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,037
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736550
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—284 **12 Claims**

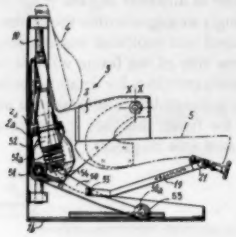


1. An apparatus for adjusting the inclination of seat upholstery arranged on a supporting plate for a driver's seat, office chair, revolving armchair or the like comprising: an intermediate plate on which at least the front region of the said seat upholstery rests, said intermediate plate being mounted on the said supporting plate for pivoting movement about a transverse axis and being angularly disposed with respect to the said supporting plate to define a wedge-shaped gap with increasing height towards the front of the said seat upholstery; a carrier operatively engaging said intermediate plate; and means mounting said carrier for movement between the said supporting plate and said intermediate plate, the spacing of said carrier from the transverse axis being variable and the spacing of said carrier from the said supporting plate being substantially constant, whereby the intermediate plate is adjustable about said transverse axis.

4,153,295
VEHICLE SEAT ASSEMBLY

Philippe Boulanger, Saulxures-les-Nancy, and Lucien Roure, Laxou, both of France, assignors to Institut National de Recherche et de Securite pour la Prevention des Accidents du Travail et des Maladies Professionnelles, France

Filed May 26, 1977, Ser. No. 800,865
Int. Cl.[2] A47C *3/00*
U.S. Cl. 297—307 **9 Claims**

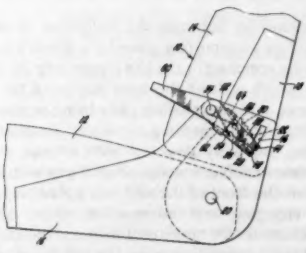


1. A seat assembly for a vehicle, particularly a land vehicle adapted to move over rough ground, said assembly comprising a base adapted to be mounted on said vehicle substantially horizontal when the vehicle is level, and a frame slidingly mounted on the base for up and down movement relative to the base, the sliding frame supporting a back for a passenger, and a seat mounted on the frame for pivotal movement relative to the back about a horizontal axis, said seat having its front part opposite to the back supported by a slanted connecting rod arranged under the seat, an oscillating suspension arm having one end pivotally mounted on the frame below the back, the other end of the suspension arm comprising a bearing roller resting on a surface of the base, resilient means comprising a hydraulic jack and a pressure accumulator acting between the frame and the oscillating arm to apply a suspension force to the latter, to ensure a flexible suspension of the sliding frame with respect to the base, said slanted connecting rod supporting the front part of the seat being hinged on the oscillating arm between the pivotal joint of the latter on the frame, and its bearing roller resting on said surface of the base, said suspension force of the hydraulic jack being applied to the oscillating arm in the vicinity of but offset from the pivotal joint of the latter on the sliding frame.

4,153,296
VEHICLE SEAT BACK RECLINING MECHANISM

Chester F. Rhamstine, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1977, Ser. No. 856,653
Int. Cl.[2] A47C *1/025*
U.S. Cl. 297—367 **3 Claims**



1. In a vehicle seat having a cushion member, a back member, and a pivot means pivotally connecting the back member to the cushion member to permit forward and rearward pivoting movement of the back member relative the cushion member, the combination comprising:

first and second rows of successively stepped teeth arranged in opposed rows on one of the members, each of said rows of teeth being non-concentric with respect to the pivot means connecting the cushion member and the back member;

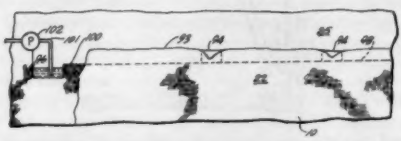
first and second latch means associated with the other member, the first latch means being engageable with the stepped teeth of one row to block forward pivoting movement of the back member and ratchet over the teeth during rearward pivoting movement, the second latch means being engageable with the stepped teeth of the other row to block rearward pivoting movement of the back member and ratchet over the teeth during forward pivoting movement;

and release means operable to selectively disengage one of the latch means to permit motion of the back member in the direction normally blocked by that latch means.

4,153,297
GROUND WATER CONTROL FOR AN IN SITU OIL SHALE RETORT

Richard D. Ridley, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jun. 30, 1977, Ser. No. 811,488
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—2 **17 Claims**



1. A method for inhibiting flow of ground water into a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort in a subterranean formation containing oil shale, the method comprising the steps of:

excavating a first portion of the formation to form an open base of operation in the formation;

explosively expanding a second portion of the formation below the base of operation to form an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, and leaving unfragmented formation forming a horizontal sill pillar below the base of operation and overlying the fragmented mass;

forming a plurality of bore holes through the sill pillar;

placing casings in the bore holes so that the casings extend above the floor of the base of operation and sealing the casings in the bore holes for inhibiting introduction of ground water into the fragmented mass through each bore hole in which such a casing is placed, and sealing any such bore holes not having such casings;

establishing a combustion zone and a retorting zone in the fragmented mass below the sill pillar;

controlling retorting operations from the base of operation by introducing an oxygen-containing gas to the fragmented mass through a plurality of such casings for sustaining the combustion zone in the fragmented mass and for advancing the combustion zone and retorting zone through the fragmented mass;

collecting ground water in the base of operation; and

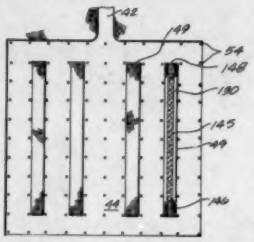
withdrawing the collected ground water from the base of operation to inhibit flow of ground water into the fragmented mass.

4,153,298

REMOVAL OF PILLARS FROM A VOID FOR EXPLOSIVE EXPANSION TOWARD THE VOID

Harry E. McCarthy, Golden, Colo., and Gordon B. French, Bakersfield, Calif., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Oct. 11, 1977, Ser. No. 840,906
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—2 **31 Claims**



1. A method of recovering shale oil from a subterranean formation containing oil shale which comprises the steps of;

(a) excavating a void in such a subterranean formation leaving upper and lower zones of unfragmented formation, each zone of unfragmented formation having a substantially horizontal free face adjoining the void, and leaving at least one support pillar of unfragmented formation, each such support pillar meeting each zone of unfragmented formation at a juncture of such a pillar and such a zone of unfragmented formation;

(b) placing explosive in the upper and lower zones of unfragmented formation for explosively expanding each of the zones toward the void;

(c) placing explosive in such pillar;

(d) detonating explosive in such pillar to fragment and explosively expand such pillar toward the void;

(e) expanding the upper and lower zones of unfragmented formation toward the void to form a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort by detonating explosive in the upper and lower zones of unfragmented formation after detonating explosive in such pillar with a time delay sufficient for creation of a free face at each such juncture of such pillar and such zone of unfragmented formation owing to explosive expansion of such pillar;

(f) introducing gas to the fragmented permeable mass in the in situ oil shale retort for establishing a retorting zone in the fragmented permeable mass wherein oil shale is retorted to produce gaseous and liquid products, and advancing the retorting zone through the fragmented mass; and

(g) withdrawing such gaseous and liquid products from the retort.

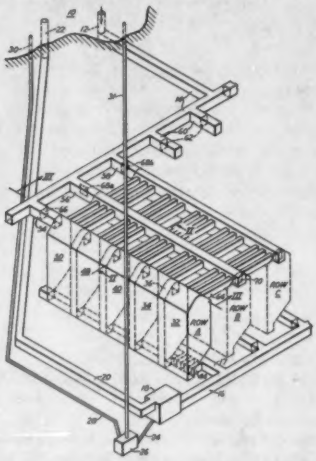
4,153,299

COMBUSTION AIR SUPPLY TO IN-SITU RETORTS

Rudolph Kvapil, Denver, and K. Malcolm Clews, Littleton, both of Colo., assignors to Golder Associates, Inc., Kirkland, Wash.

Filed May 23, 1978, Ser. No. 908,796
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—2 **19 Claims**

6. A system for the production of shale oil from a subsurface deposit of a carbonaceous material comprising a combustion air tunnel extending substantially horizontally through the subsurface deposit, a plurality of spaced-apart parallel apex drifts extending from the air supply tunnel, a row of retorts separated by end pillars extending downwardly from an apex drift, the apex drift forming the crown of the retorts in the row, the apex drift adjacent to the row of retorts being over undisturbed carbonaceous deposit, cross drifts extending from the adjacent apex drift opposite each retort in the row to communicate with the apex drift forming the crown of each retort, means for delivering air for combustion of carbonaceous material in the retorts through the adjacent apex drift and cross



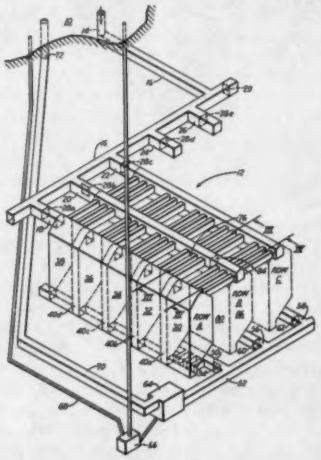
drifts into the retorts, an adjustable door in the cross drifts for controlling the flow of combustion air through the cross drifts and for closing the cross drift after combustion in the retort supplied by the cross drift is completed.

4,153,300

RECOVERY OF FLUID FUELS BY IN-SITU RETORTING OF CARBONACEOUS DEPOSITS

Rudolph Kvapil, Denver, and K. Malcolm Clews, Littleton, both of Colo., assignors to Golder Associates, Inc., Kirkland, Wash.

Filed May 23, 1978, Ser. No. 908,797
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—2 **17 Claims**



1. A method for producing a fluid fuel from subsurface deposits of carbonaceous material comprising driving a plurality of substantially parallel, spaced-apart apex drifts from a combustion air supply tunnel, constructing a row of rubblized retorts under each of the apex drifts whereby the apex drifts form the crown of the retorts and the rows of retorts are separated by side pillars, said retorts having a rectangular horizontal cross section with the ratio of length to width being at least 1.5:1 and being arranged end-to-end in the row with the retorts separated from adjacent retorts in the row by end pillars, said retorts having a ceiling sloping upward at an angle

with the horizontal greater than 40 degrees from each of the sides to the apex drift, barricading the apex drift in each of the end pillars to isolate the retorts from one another, said retorts having a bottom sloping downwardly to an outlet at the lower end of the retort, driving an exhaust tunnel communicating with the outlet below the sloping bottom of the retorts in the row beyond the end of the row to a collection tunnel, injecting combustion air into the apex drift of the retorts and igniting the carbonaceous material at the upper end thereof to burn carbonaceous material in the retort, continuing the injection of combustion air to move the combustion front downwardly through the retort to liberate a fluid fuel from the carbonaceous material, and delivering products of the retorting through the outlet to the exhaust tunnel for delivery to the collection tunnel and the surface.

4,153,301

APPARATUS FOR BREAKING UP A LAYER OF SUBSTANTIALLY RIGID MATERIAL

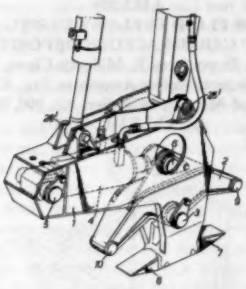
Anthony C. Armstrong, Abergavenny, Wales, assignor to Hy-Mac Limited, Rhymney, Wales

Continuation of Ser. No. 609,966, Sep. 3, 1975, abandoned. This application Jun. 16, 1977, Ser. No. 807,124

Claims priority, application United Kingdom, Sep. 10, 1974, 39440/74

Int. Cl.[2] E01C *23/12*

U.S. Cl. 299—36 **14 Claims**



1. Apparatus for breaking up a layer of a substantially rigid material, for example, concrete or masonry, the apparatus having a pincer mechanism including first and second rigid jaw members, the first jaw member having a single projecting tooth with an axis extending from the root of the tooth to the tip of the tooth, the second jaw member having a pressure surface directly opposed to the tooth, the second jaw member being movably mounted on the first jaw member to form a combination including a substantially U-shaped structure having an opening for receiving a layer to be broken between the tooth and the pressure surface, the axis of the tooth forming one limb of the U-shaped structure, and the movable mounting being such as to cause at least one point of the pressure surface to move along a path which is such that the point would pass through the tip of the tooth if the second jaw member were to be moved a sufficient amount, whereby the tooth and the pressure surface of the second jaw member can be closed on to a layer as a result of the movement of the second jaw member relative to the first jaw member, and hydraulic ram means mounted on the first jaw member coupled to the second jaw member to move the pressure surface along said path a sufficient distance to close it on to a layer to be broken, the first jaw member having mounting means enabling a torque about an axis perpendicular to the plane of the U-shaped structure to be applied to the apparatus.

4,153,302

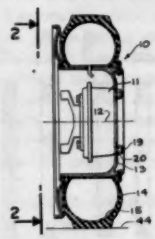
MOTOR VEHICLE SAFETY WHEEL

Melvin L. Bass, 2262 Kaydel St., Whittier, Calif. 90601, and Wesley E. Buford, 1042 Wingate, Covina, Calif. 91723

Filed Sep. 22, 1977, Ser. No. 835,633

Int. Cl.[2] B60C *17/00*

U.S. Cl. 301—39 T **2 Claims**



1. A safety wheel comprising:

a wheel body having a rim portion about which an inflatable tire is to be received, and having a mounting flange portion extending generally radially inwardly from said rim portion and containing apertures for connection to the wheel body of a vehicle;

said rim portion of the wheel body having an essentially cylindrical outer surface about which the tire is received, and having a portion deformed to provide a radially outwardly turned essentially annular shoulder integral with the rest of the rim portion and located at the axially inner side thereof and projecting radially outwardly beyond said cylindrical surface;

a safety flange formed separately from said wheel body and having a radially annular inner edge portion received about and of a diameter corresponding approximately to said cylindrical surface on the wheel body at a location axially between said shoulder and the tire;

said radially inner portion of said safety flange having a surface engageable with a first bead of the tire to retain the tire at its axially inner side;

a weld at the side of said safety flange facing away from the tire and rigidly securing the safety flange to said outwardly turned shoulder of the rim portion of the wheel body;

said safety flange extending generally radially outwardly at the axially inner side of the tire to a peripheral edge which is of a diameter slightly less than the external diameter of the tire and adapted to engage a road surface and support the vehicle upon deflation of the tire;

said rim portion of the wheel body containing an essentially annular groove at the axially outer side of the tire; and

a resilient retaining ring detachably receivable within said groove and acting to retain an outer bead of the tire against expanding movement.

4,153,303

MULTIPART HUB ASSEMBLY

Robert G. Tanner, St. Charles, Mo., assignor to Arundale, Inc., St. Louis, Mo.

Filed Feb. 10, 1978, Ser. No. 876,766

Int. Cl.[2] B60B *5/02*

U.S. Cl. 301—63 PW **7 Claims**

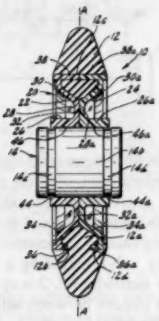
1. A multipart hub and core assembly for use in the manufacture of a composite wheel including a tire, a hub and a center core; said hub and core assembly comprising:

a first hub member having a first annular inner rim portion concentric with the axis of rotation of the wheel; a first web portion extending radially outward from the axial inner end of said first rim portion and a first tire support portion carried by said first web portion and located concentrically with said first rim portion;

a second hub member having a second annular rim portion concentric with the axis of rotation of the wheel; a second web portion extending radially outward from the axial inner end of said second rim portion and a second tire support portion carried by said second web portion and located concentrically with said second rim portion;

the axial outermost ends of each of said first and second rim portions being notched at circumferentially spaced intervals therearound in order to facilitate radial flexure thereof and having radially inwardly directed detents thereon;

a substantially cylindrical, inner core including a first annular groove in the exterior surface thereof located adjacent one end thereof and a second annular groove in the exterior surface thereof located adjacent the opposite end thereof;



said core being insertable within said first rim portion to thereby forceably flex said first inner rim portion radially outwardly and said first hub member being held in place on said core by the radially inwardly directed force of said detents on said first rim portion engaged within said first groove; and said core being insertable within said second rim portion to thereby forceably flex said second rim portion radially outwardly, and said second hub member being held in place on said core, wherein said first and second web portions are in abutting relationship, by the radially inwardly-directed force of said detents on said second rim portion engaged within said second groove; and

said first and second tire support portions being formed to conform to and hold the radially innermost portion of such tire when said web portions are in said abutting relationship.

4,153,304

APPARATUS FOR TRANSPORTING FLOWABLE PARTICULATE MATERIAL

Richard H. Haskins, Worcester, England, assignor to Hascon (U.K.) Limited, England

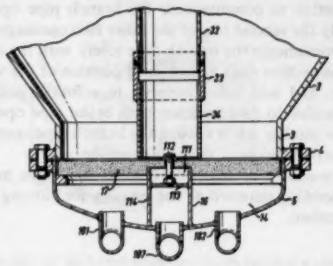
Filed Aug. 15, 1977, Ser. No. 824,512

Claims priority, application United Kingdom, May 3, 1977, 18575/77

Int. Cl.[2] B65G *53/22, 3/14*

U.S. Cl. 406—28 **5 Claims**

1. Apparatus for transporting flowable particulate material and of the kind comprising a container for receiving the material to be transported, said container including a material receiving chamber and a gas inlet chamber adjacent said material receiving chamber and separated therefrom by a porous wall, a material inlet in said container communicating with said material receiving chamber, means for opening and shutting said material inlet, a gas inlet connected to said gas inlet chamber, means for opening and shutting said gas inlet, a material outlet permitting transportation of material from said material receiving chamber, means for opening and shutting the material outlet, a pressure sensor in said material receiving chamber, and means operated by said pressure sensor when sensing a predetermined pressure in said material receiving chamber for opening said material outlet, wherein said material outlet comprises a conduit between said material receiving chamber and a location external to said container, one end portion of said conduit being permitted relative longitudinal movement with respect to another portion of said conduit to provide a predetermined spaced relationship between said one portion



and said porous wall and wherein said gas inlet chamber is separated into two parts by a gas inlet compartment depending within the chamber from the porous wall, and two manually adjustable control valve means for controlling the supply of gas to the gas inlet chamber and the gas inlet compartment respectively according to the particular material being handled, a bore formed in said porous wall for receiving said gas inlet compartment, the depth of said bore is less than the thickness of said porous wall.

4,153,305

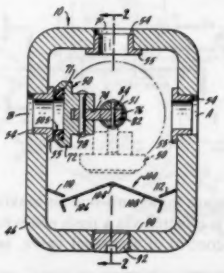
RAILROAD AIR BRAKE SYSTEMS

Leroy P. Kennedy, Mahwah, N.J., and James L. Kalkstein, Monsey, N.Y., assignors to Abex Corporation, New York, N.Y.

Filed Mar. 2, 1978, Ser. No. 882,791

Int. Cl.[2] B60T *17/04*

U.S. Cl. 303—81 **17 Claims**



1. In a brake system for a railroad vehicle equipped with a brake cylinder which receives fluid under pressure from an auxiliary reservoir when a fluid operated brake control valve, interposed between said cylinder and reservoir, is opened by a change in fluid pressure in a brake pipe, said brake control valve being connected to the brake pipe by a branch pipe which intersects a sectioned portion of the brake pipe:

a valve housing having three communicating openings of which one is assigned to the proximal end of the branch pipe and of which the remaining two are respectively assigned to the sectioned ends of the brake pipe;

a selectively positionable valve member inside the valve housing;

said valve member bearing effective in a first position to place all three openings in communication with each other thereby to communicate the branch pipe with both section ends of the brake pipe in said first position of the valve member, said valve member being effective in a second position to communicate the branch pipe opening with only a first one of the other two openings thereby to communicate the branch pipe solely with only one of the brake pipe section ends in said second position of the valve member, said valve member being effective in a third position to communicate the branch pipe opening with only the second one of the other two openings thereby to communicate the branch type solely with the other brake pipe section ends in said third position of the valve member, and said valve member in a fourth position being effective to communicate both brake pipe openings with one another while closing the branch pipe opening in said fourth position of the valve member;

and operating means connected to said valve member and extending outward at the housing for turning said valve member.

4,153,306

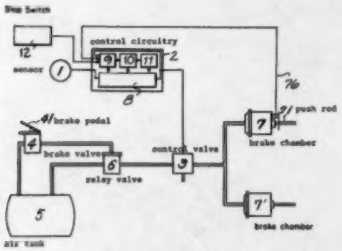
FAIL-SAFE APPARATUS FOR ANTI-SKID BRAKING SYSTEM

Takefumi Sato, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 696,806, Jun. 16, 1976, abandoned. This application Feb. 22, 1978, Ser. No. 880,081

Int. Cl.[2] B60T *8/00*

U.S. Cl. 303—92 **3 Claims**



1. Fail-safe means for an anti-skid air braking system wherein braking action is effected via a push rod within a brake chamber under the control of a control valve, said fail-safe means comprising:

an actuating element mounted on said push rod for movement in unison therewith;

a stroke detecting limit switch mounted on the exterior of said brake chamber in operable association with said actuating element;

whereby reciprocative movement of said push rod and said actuating element causes actuation and deactuation of said stroke detecting limit switch to produce a control signal; and

utilization means for utilizing the control signal from said stroke detecting limit switch as an input to said fail-safe means for the purpose of upon detecting an abnormal status in the anti-skid air braking system to render said anti-skid air braking system inoperative.

4,153,307

WHEEL LOCK PREVENTION APPARATUS

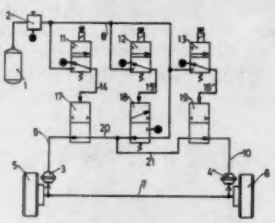
Hermann J. Goebels, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,598

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625502

Int. Cl.[2] B60T *8/04*

U.S. Cl. 303—119 **6 Claims**



1. Wheel lock prevention apparatus for the brakes of a motor vehicle having a common control of the pressure applied to the brake cylinders of a given vehicle axle, the improvement wherein a 3/2-way valve is positioned in a brake line extending to the two brake cylinders associated with the respective wheels, said 3/2-way valve including a further brake branch line that extends to individual 2/2-way valves that are provided in the control system between said first 3/2-way valve and said respective brake cylinders.

4,153,308

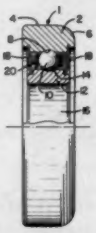
FORKLIFT MAST UNIT WITH HIGH IMPACT BEARING ASSEMBLY

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Division of Ser. No. 617,479, Sep. 29, 1975, Pat. No. 4,054,339. This application Jul. 25, 1977, Ser. No. 818,492

Int. Cl.[2] F16C *33/00, 33/58, 33/64*

U.S. Cl. 308—189 R **4 Claims**



1. In a forklift mast unit including an upright element having at least one load-bearing longitudinal track, a carriage arranged for longitudinal movement relative to the upright element, motor means for moving the carriage relative to the upright element, at least one high-impart antifriction bearing assembly attached to the carriage for load-bearing rolling contact with the at least one load-bearing longitudinal track, the improvement comprising:

said high-impact antifriction bearing assembly having an inner race member with a radially outward facing annular raceway extending around the outside thereof, race member circumferentially encompassing and disposed radially outward of said inner race member and comprising a radially inward facing annular raceway extending circumferentially around the inside thereof coaxial with the axis

of rotation of said bearing assembly, a plurality of antifriction rolling elements confined between said inner race member and said outer race member and rolling in said raceways thereof, the raceway of at least one of said race members having small rounded shock-absorbing protrusions projecting outwardly from the surface thereof with surface finishes between 75 and 250 microinches R.M.S.

4,153,309

SHOULDERLESS ROLLER BEARING

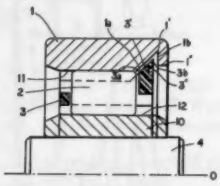
Günter Markfelder, and Heinrich Hofmann, both of Schweinfurt, Fed. Rep. of Germany, assignors to Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 845,905

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648985

Int. Cl.[2] F16C *33/46*

U.S. Cl. 308—217 **8 Claims**



1. In a journal bearing comprising two relatively rotatable members with coaxial cylindrical track surfaces separated by an annular gap, a set of rotary bodies in said gap engaging said track surfaces, and annular cage means of elastic material in said gap formed with a plurality of pockets containing said bodies, said track surfaces being free from shoulders projecting into said gap,

the improvement wherein at least one of said members is provided with at least one annular peripheral retaining groove on its track surface, said retaining groove being bounded by a lateral end zone of said one of said members, said lateral end zone being radially recessed with respect to a central portion of the last-mentioned track surface engaged by said bodies, said cage means being provided with at least one annular flange snap-fitted into said retaining groove and axially offset from said pockets, said flange having an outer transverse face confronting said end zone, said transverse face being formed with an annular incision centered on the axis of said track surfaces and radially offset from said gap for increasing the resiliency of said flange to facilitate the insertion of said cage means into said gap and said flange into said retaining groove while preventing an axial displacement of said flange beyond said retaining groove.

4,153,310

AIR CONDITIONING OUTDOOR SECTION CABINET CONSTRUCTION

Roderick L. Loving, and Louis P. Hine, Jr., both of Norman, Okla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 26, 1978, Ser. No. 919,540

Int. Cl.[2] H05K *5/00*

U.S. Cl. 312—100 **3 Claims**

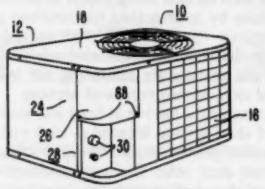
1. In an air conditioning system outdoor section cabinet of the type including an air flow section and an enclosed opposite end section, a construction comprising:

the opposite end section including a one-piece, vertically-disposed panel having an inside corner shape in transverse section and locate at one corner of said opposite end section to form two adjacent walls of a space recessed relative to the corresponding outside corners of the top and bottom walls of the cabinet;

a horizontal shelf located at an intermediate height to define the bottom wall of an electrical components compartment in the upper part of said recessed space;

a cover enclosing the outer side of said electrical components compartment;

the lower part of said recessed space being open and one wall thereof including opening means therein to accommodate the projection of a pair of refrigerant line fittings;



the upper part of said two adjacent walls having a multiplicity of fastener and passage openings therein, the multiplicities spanning the same area of the walls and being of the same number regardless of the height of the cabinet according to the different type and capacity models to accommodate all of the various sizes and types of electrical components mounted in said electrical components compartment in accordance with the particular model.

4,153,311

SECTIONAL UNIT FURNITURE ASSEMBLY

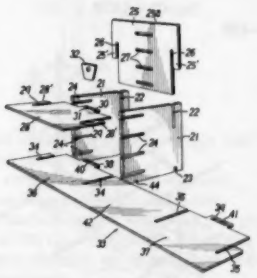
Tadao Takahashi, Nishiageo Daini Danchi 3-9-203, No. 77-1, Ooaza Koshikiya, Ageo-shi, Saitama-ken, Japan

Filed Dec. 7, 1977, Ser. No. 858,336

Claims priority, application Japan, Nov. 22, 1977, 52-157101[U]

Int. Cl.[2] A47B *87/00*

U.S. Cl. 312—107 **2 Claims**



1. A sectional unit furniture assembly comprising:

at least two juxtaposed sectional units each consisting of at least a pair of opposingly spaced side wall sections, a rear wall section and a shelf section; and

at least one connecting board for interconnecting the juxtaposed units;

each one of said side wall sections consisting of a rectangular board having a vertical interlocking groove notched into the upper edge close to and parallel with the rear edge, a joint groove notched into the lower edge in vertical alignment with said interlocking groove in the upper edge and a number of horizontal grooves notched into the front edge in a predetermined parallel spaced relationship;

said rear wall section consisting of a rectangular board with laterally extending wing portions at the opposite sides,

said wing portions having a pair of parallel grooves for interlocking engagement with said vertical grooves in the respective side wall section, and a number of horizontal slots provided along the vertical axis in the same parallel spaced relationship as said horizontal grooves at the front edges of said side wall sections;

said shelf section consisting of a rectangular board with laterally extending wing portions at the opposite sides, a pair of parallel notched grooves formed in the wing portions and spaced from each other by the same distance as said parallel grooves of said rear wall section and a rearwardly extending tab at an intermediate point of the rear edge, said shelf section being joined with said side and rear wall sections by interlocking the notched grooves in the wing portions thereof with the opposing horizontal grooves at the front edges of said side wall sections and inserting the rearwardly extending tab into one of said horizontal slots in said rear wall section;

said connecting board having at least one shelf portion similar to said shelf section located at each end of the board, each said shelf portion including a pair of parallel grooves spaced from each other the same distance as the parallel grooves of the shelf section for interlocking each shelf portion with the opposing horizontal grooves at front edges of the side wall sections of each respective juxtaposed unit and further including a rearwardly extending tab between said parallel grooves which is inserted into one of the horizontal slots in the rear wall section of each respective juxtaposed unit, said connecting board further having a connecting portion integrally interconnecting the shelf portions and extending between the inner parallel grooves of each respective shelf portion, the length of said connecting portion being determined according to the desired width of the furniture assembly and serving as at least one additional shelf portion between the juxtaposed sectional units.

4,153,312

MOBILE RACK SYSTEM

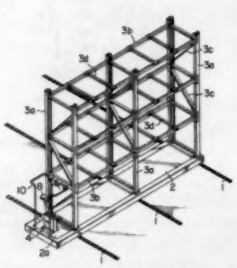
Genshi Taniwaki, Kumamoto, Japan, assignor to Kongo Co., Ltd., Kumamoto, Japan

Filed Aug. 11, 1977, Ser. No. 823,941

Claims priority, application Japan, Aug. 12, 1976, 51-108143[U]

Int. Cl.[2] A47B *87/00*

U.S. Cl. 312—198 **7 Claims**



1. A mobile rack system comprising:

(a) a plurality of rails;

(b) a plurality of mobile racks mounted on said rails for movement along said rails;

(c) at least one driving means for driving said mobile racks along said rails, said driving means including manually operated pedal means for supplying the driving power to said driving means,

(d) said at least one driving means is a plurality of driving means and one of said driving means is provided on each of said mobile racks; and

(e) said pedal means includes a pair of pedals, mounted on a shaft, on which the manual power is exerted, and said driving means includes a saddle for the operator, the position of which is switchable in accordance with the direction of the movement of the mobile rack, at least a pair of driving wheels mounted on a shaft provided on said mobile rack for rolling on said rails, and a speed reduction transmission mechanism through which the shaft of said pedals is connected to the shaft of said driving wheels.

4,153,313

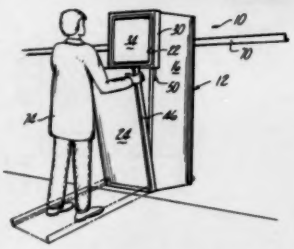
STORAGE LOCKER

Robert L. Propst, Ann Arbor, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed May 5, 1978, Ser. No. 903,247

Int. Cl.[2] A47B *81/00*; A47G *91/00*

U.S. Cl. 312—211 **10 Claims**



1. A storage locker comprising an upright hollow body having a rear wall, side walls, a top wall and a bottom wall, a plurality of front wall panels removably mounted on said body in a vertical arrangement, each of said front wall panels being mounted on and removable from said body independent of the remaining ones of said front wall panels, an upper one of said front wall panels having an inlet opening enabling articles to be deposited in said storage locker, means on said body supportingly engaged with each of said panels so as to support said panels against vertical movement on said body, each of said panels having side flanges overlapping said body side walls and spring urged toward said side walls, and coacting stop means on said flanges and said side walls engageable in positions of said flanges sprung toward each other so as to retain said panels on said body.

4,153,314

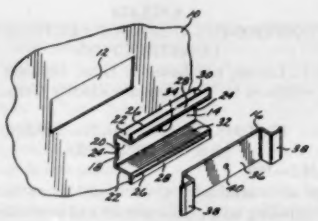
HANDLE ASSEMBLY

Earle F. Prater, Long Beach, Calif., assignor to The Birtcher Corporation, Los Angeles, Calif.

Filed Mar. 6, 1978, Ser. No. 883,490

Int. Cl.[2] A47B *95/02*

U.S. Cl. 312—320 **9 Claims**



1. A two piece handle assembly adapted for exterior mounting within a panel having a simple cut out aperture comprising;

a handle member having a U-shaped cross sectional configu-

ration and at least two flanges, the handle member being insertable through said aperture in the panel, the flanges engaging the outer surface of the panel after insertion of the handle member into the aperture, and

a keeper member having a U-shaped cross-sectional configuration and at least two legs, the keeper member being of such dimensions so as to enable the keeper member's legs to tightly slide between the handle member and the panel when their U-shaped cross-sectional configurations are arranged traverse to each other, and capable of providing a closed space, the keeper member being inserted in the aperture in the panel so that each of the legs of the keeper member engage an inside surface of the panel, at an end of the aperture offset from the outside surface contact of the handle member flanges whereby the handle member is kept securely in place, and the handle assembly provides a closed space to prevent access into the panel, and means for locking the respective handle member and keeper member into position when they are assembled into a handle assembly.

4,153,315

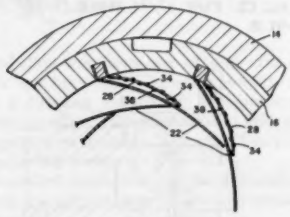
FOIL BEARING STIFFENER

Alexander Silver, Tarzana, and James R. Wenban, Redondo Beach, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 24, 1976, Ser. No. 689,620

Int. Cl.[2] F16C *35/00*

U.S. Cl. 308—9 **26 Claims**



1. A hydrodynamic fluid bearing comprising:

first and second bearing elements movable with respect to each other and spaced apart to form a fluid gap therebetween;

at least one bearing foil attached to one of said bearing elements, said foil loosely conforming to the shape of said bearing elements;

foil stiffening means operatively associated with one of said bearing members and contacting said bearing foil at least at one point for increasing the effective stiffness of said bearing foil, said foil stiffening means having a first operative configuration for providing damping by bending and a second operative configuration for providing damping by compression.

4,153,316

METHOD OF SEALING AN IMAGE INTENSIFIER TUBE, AND AN IMAGE INTENSIFIER TUBE THUS PRODUCED

Johannes J. Houtkamp, Delft, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed Apr. 15, 1977, Ser. No. 787,933

Claims priority, application Netherlands, Apr. 20, 1976, 7604144

Int. Cl.[2] H01J *9/18*

U.S. Cl. 316—19 **4 Claims**

1. A method of making an image intensifier tube having cathode and anode windows on a common optical axis comprising the steps of

securing a substantially radial, electrically conductive flange to the periphery of each of said cathode and anode windows,

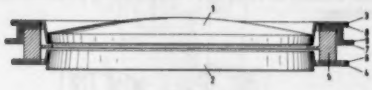
depositing a phosphor layer on said anode window,

connecting a first ring to a first one of said conductive flanges with an edge of said first ring projecting radially beyond said conductive flanges,

connecting a second ring to one side of a ring-shaped wall of electrically insulating material,

securing the other side of said wall to the other of said conductive flanges,

placing the anode and cathode windows with the secured flanges and wall and with the connected rings in a vacuum,



depositing a photo-sensitive layer on the cathode window in said vacuum,

moving said anode and cathode windows to positions along a common optical axis in spaced relationship to each other with the edge of said first ring abutting an edge of said second ring in said vacuum after said depositing of the photo-sensitive layer, and

cold welding said abutting edges together in said vacuum whereby the first and second rings are sealing secured to each other.

4,153,317

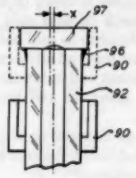
INDIUM SEAL FOR GAS LASER

Bo H. G. Ljung, and James G. Koper, both of Wayne, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Dec. 2, 1977, Ser. No. 856,709

Int. Cl.[2] B23K *1/20*; H01J *9/26*

U.S. Cl. 316—19 **9 Claims**



1. The method of making a hard vacuum seal between surfaces to be sealed comprising:

polishing the surfaces to be sealed together,

placing said surfaces in a plasma chamber,

cleaning said surfaces to be sealed with a plasma cleaner consisting of 3% O_2 and 97% He, subjecting said surfaces while in said chamber to rf power of 300 watts for a predetermined time,

applying a vacuum to said surfaces to hold said surfaces in contact,

applying molten indium onto said contacting surfaces, avoiding penetration of said molten indium into the interface between said surfaces, and

allowing said indium to set forming said seal.

4,153,318

BUS STAB FOR PANELBOARD ASSEMBLY

Clifford F. Bishop, and John T. Schultz, both of Cedar Rapids, Iowa, assignors to Square D Company, Park Ridge, Ill.

Filed Oct. 17, 1977, Ser. No. 842,430

Int. Cl.[2] H01R *9/18*; H02B *1/20*; H02G *5/00*

U.S. Cl. 339—22 B **4 Claims**

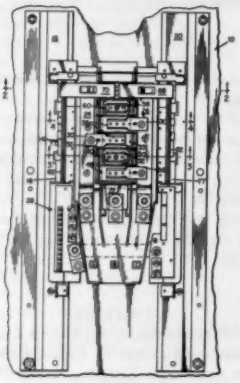
1. A bus stab in an interior assembly of a panelboard adapted

to be mounted in a metal cabinet for use in establishing an electrical connection from a bus bar to a respective terminal of a pair of circuit breakers, each of said circuit breakers carrying a respective terminal at a position spaced adjacent one end of the respective circuit breaker, the improvement comprising;

a back leg for said stab having a tab extending from one end of said back leg and adapted to be fastened to said bus bar,

a pair of spaced parallel side legs transverse to said back leg and extending from said back leg along a portion of said back leg,

an electrically insulating member having a generally planar wall engaging said back wall to support said bus stab on said cabinet in close heat transmitting relationship to said cabinet,



rail means integrally formed on said insulating member and engaging each circuit breaker of said pair or positioning the one end of each of said pair of circuit breakers in overlapping relationship to said back leg with each circuit breaker of said pair secured adjacent a respective opposite end to said rail means and extending towards said portion of said back leg along an axis located intermediate said parallel side legs,

each of said side legs adapted to engage with a spring clip terminal carried adjacent the one end of a respective one of said circuit breakers,

said portion of said back leg having a pair of spaced openings for securing a bolt-on terminal carried adjacent the one end of a respective circuit breaker of said pair of circuit breakers to secure said bolt-on terminal at a respective position on said back leg.

4,153,319

LOCKING SHIELD FOR ELECTRICAL TERMINAL

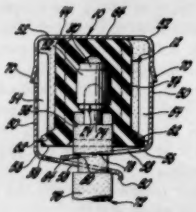
Robert G. Plyler, Vienna; George F. Seagreaves, Warren, and Lyle B. Suverison, Fowler, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1977, Ser. No. 859,727

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—75 P **3 Claims**

1. In combination with an electrical conductor having a terminal attached thereto and encased in an insulator body provided with a passage leading from a wall of the body to the encased terminal, a locking shield comprising, a sheet metal member having a base portion secured to the insulator body and including a pair of manually movable flanges resiliently connected thereto and encompassing the insulator body, said flanges having apertured portions overlapping each other and said passage, said flanges being normally resiliently biased to a position locating said apertures in a misaligned condition with respect to each other and said passage, said flanges being manually movable relative to each other to align said apertures and passage and allow insertion of a mating terminal therethrough into electrical engagement with the encased terminal, the resilient bias of said flanges upon manual release thereof tending to misalign said apertures and engage the edges thereof with said mating terminal to resist movement thereof out of said passage, said sheet metal member being electrically insulated from the encased terminal by said insulator body.



4,153,320

CONNECTOR FOR A CABLE, HOSE OR THE LIKE

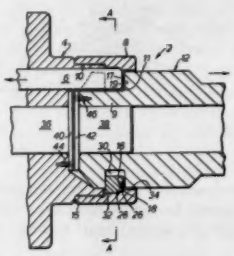
Maurice P. Townshend, Castle Cary, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Sep. 26, 1977, Ser. No. 836,799

Claims priority, application United Kingdom, Dec. 21, 1976, 53283/76

Int. Cl.[2] F16L *37/26*; H01R *13/54*

U.S. Cl. 339—91 B **11 Claims**



1. A connector for a cable, hose, or the like comprising a female portion having a collar, a male portion adapted to be joined with said female portion along a longitudinal axis of said connector, said male portion comprising a ring of engaging members spaced about the periphery of said male portion and adapted to be moved outwardly to engage the collar to retain the female and male portions together, means for moving said engaging members comprising a pin disposed offset from the longitudinal axis of the connector for insertion between a pair of engaging members to move the ring of members outwardly, and when removed from between a pair of engaging members, said members are adapted to move inwardly, wherein said members, when moved inwardly, disengage the male portion from the collar of the female portion, so that the male and female portions can separate.

4,153,321

BATTERY BOOSTER CABLE

Rogelio R. Pombrol, Miramar, Fla., assignor to Kravex Manufacturing Company, Miami, Fla.

Filed Mar. 17, 1977, Ser. No. 778,389

Int. Cl.[2] H01R *11/24*

U.S. Cl. 339—95 B **7 Claims**

1. A clamp for a battery booster cable comprising:

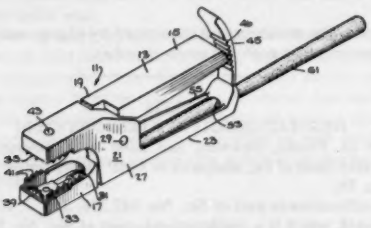
(a) a first member having at one end thereof a substantially

horizontally extending first arm portion of a first width, an essentially horizontally extending first jaw portion at the other end thereof and a substantially vertical portion of a width approximately half said first width joining said first arm portion and said first jaw portion;

(b) a second member of essentially identical design having a second arm portion and second jaw portion and a second essentially vertical portion, said first and second members placed with their substantially vertical portions in abutting relationship with said first arm portion disposed directly above said second arm portion and said second jaw portion disposed directly above the first jaw portion;

(c) hinging means at said first and second substantially vertical portions joining said first and second members thereby forming a structure in the nature of a pliers whereby relative movement of said arm portions together and away from each other will result in similar movement of said jaw portions;

(d) an arcuate, flexible member extending essentially in a



vertical direction from one of said arm portions, said flexible member contain thereon a plurality of teeth pointing in a direction toward said arm portion said flexible member biased in a direction toward said jaw portions;

(e) a projection on the end of said other arm portion adapted to engage said teeth;

(f) a first toothed conductive member disposed at the inside of said first jaw portion, its teeth pointing toward said second jaw portion;

(g) a second conductive member disposed at the inside of said second jaw portion, its teeth pointing toward said first jaw portion, whereby said jaw portions may be separated by applying a force against said flexible member to move it away from said teeth, said jaw portions placed around the battery terminal, said arm portions brought together thereby bringing said jaw portions together to apply a clamping force to said terminal and said jaw portions and arm portions held in position by the ratchet action existing between said teeth on said flexible member and said projection on said other arm portion.

4,153,322

KEYHOLE GROUNDING CLAMP

Edmund A. Godfrey, Scarborough, Canada, assignor to A. B. Chance Company, Centralia, Mo.

Filed Sep. 7, 1977, Ser. No. 831,339
Int. Cl.[2] H01R *7/08, 3/06*
U.S. Cl. 339—95 R **3 Claims**

1. A grounding clamp assembly for releasably coupling a ground cable with an electrical device in environments where high fault currents may be experienced, said assembly including:

a rigid, generally annular body defining a central, open-ended passage;

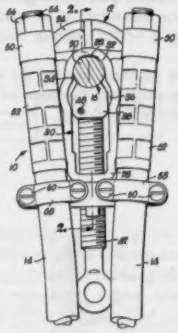
means attaching said cable to the body;

a male member adapted to be mounted on said device in outwardly projecting relation thereto,

said passage including a bight adapted to receive and grippingly engage said member; and

means for selectively biasing the member against said bight to form a secure connection between said body and the member,

said body fully circumscribing said passage, the latter having a transverse cross-section presenting a continuous periphery for resisting distortion of the member-engaging bight when high fault currents are conducted to the assembly,



the cross-section of said passage including a keyhole-shaped portion having a head zone and neck zone of smaller cross-sectional area than said head zone,

said bight forming a part of said neck zone,

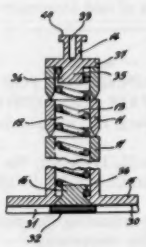
said member including a shank configured to be received within said neck zone and an enlarged shoulder on one end of said shank for locking said body onto said shank when the latter is disposed within the neck zone.

4,153,323

ELECTRICAL CONNECTOR POST

Theodore Wildi, Quebec, Canada, and Bertrand Huard, Ancienne-Loretta, Canada, assignors to Lab-Volt Limited, Quebec, Canada

Filed Apr. 11, 1978, Ser. No. 895,526
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—95 R **7 Claims**



1. An electrical connector device comprising two or more electrically conducting elements, resilient means secured between end ones of said conducting elements to urge said conducting elements in contact with one another and in substantially axial alignment, said resilient means extending through a through bore in at least some of said conducting elements.

4,153,324

SELF-STRIPPING ELECTRICAL TERMINAL

Frank A. Kukla, Cicero, Ill., assignor to Microdot, Inc., Franklin Park, Ill.

Filed Mar. 8, 1978, Ser. No. 884,489
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—97 R **14 Claims**

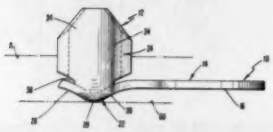
1. An electrical terminal of the type including a mounting

portion and an integral conductor clamping portion which strips and captures an insulated conductor, said clamping portion including:

a base;

a pair of walls projecting from said base, each wall including a pair of arm portions, the arm portions of one wall being spaced oppositely from corresponding arm portions of the other wall to form a pair of longitudinally spaced slots, each arm portion extending at an acute angle relative to a plane bisecting a vertex joining said arm portions and comprising:

a guide surface inclined toward its associated slot such that the opposing arm portions of each wall orient a conductor above the slots,



each guide surface including an inner edge which is sharpened to define a cutting edge for piercing an insulation cover of the conductor as the conductor is pushed into the slots, and each guide surface being bevelled from said cutting edge in a direction generally away from the other guide surface of the same wall so that as the insulation cover is pierced, it is wedged outwardly of the terminal, and

a termination surface extending from said guide surface toward said base and forming the sides of said slots; each termination surface being oriented such that conductive engagement between said termination surface and the wire portion of said conductor extends along the entire width of said termination surface.

4,153,325

METHOD AND CONNECTOR FOR TERMINATING TWISTED PAIR AND RIBBON CABLE

John C. Asick, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 22, 1978, Ser. No. 879,838

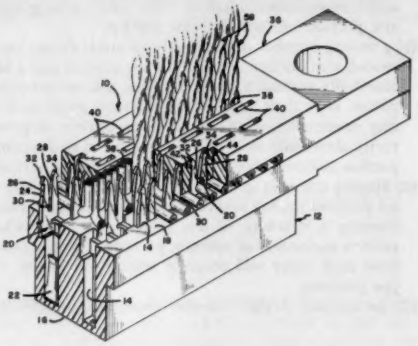
Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—99 R **5 Claims**

1. A connector for terminating flat multi-conductor twisted pair and/or ribbon cable comprising:

an elongated base member having a plurality of terminal receiving passages therein extending between first and second mating faces, a like plurality of terminals each mounted in a respective passage, each said terminal having an insulation piercing, conductor engaging portion extending beyond said first mating face and a portion profiled to mate with a further terminal and lying at least partially within said passage directed towards said second mating face; and

a cover profiled for engagement with said first mating surface and having a centrally disposed elongated slot in a web portion thereof, a plurality of profiled terminal receiving passages opening on a mating face of said cover each said passage being aligned with a respective terminal in said base member, and a plurality of parallel spaced extensions forming a comb-like member on each side of and normal to said elongated slot, whereby a multi-conductor twisted pair or ribbon cable is fed through the slot in a direction normal to the longitudinal axis of the cover, the individual conductors thereof laced into the respective



comb-like members and terminated by engagement of the base member with the cover member.

4,153,326

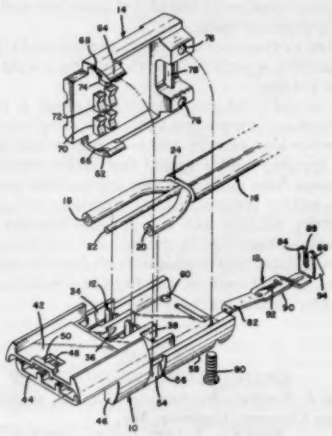
HERMAPHRODITIC WIRING SYSTEM

Robert H. Frantz, Newville, and John A. Zimmerman, Jr., Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 647,236, Jan. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 526,350, Nov. 22, 1974, abandoned. This application Mar. 17, 1978, Ser. No. 887,707

Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—99 R **6 Claims**



1. A matable electrical connector assembly for conventional house wiring applications and the like, each said assembly comprising:

a connector housing block having a body of insulating material defining a conductor engaging portion and an oppositely directed mating face, at least two profiled terminal bores in said block extending from said conductor engaging portion to open on said mating face, each said bore having an access slot at the conductor end thereof, one said slot being of lesser length than the remaining slots, first and second channel-shaped walls integral with said block and extending from said mating face in cantilever fashion in parallel spaced relation to define therebetween

a female receptacle, said channel shape of said first walls being defined by a flat base and spaced arcuate sidewalls, said first walls having their channel configurations opening inwardly towards each other, said second walls being spaced more inwardly from the peripherial edge of mating face of said block than said first walls forming an outwardly directed step, said second walls having outer dimensions and configuration adapted to mate with the inner surface of said first walls, locking means including an outwardly directed lug on said second walls spaced from the free end thereof and an aperture in said first walls spaced a like distance from the free end thereof;

a plurality of hermaphroditic terminals equal in number to the bores in said housing, each said terminal having a mating blade portion extending in a first direction from a body and means on the opposite end defining an insulation piercing conductor engaging portion, and lance means adapted to fixedly mount said terminals in a respective one of said bores with said mating blade portion projecting from said mating face and enclosed by said first and second walls; and

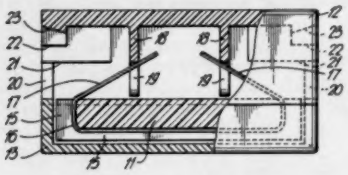
a cover member matable with said conductor receiving portion, said cover member having at least one conductor guiding member depending from an inner surface thereof and aligned to guide and drive a conductor into said insulation displacing means of the associated contact, means to detachably secure said cover member on said conductor receiving portion to grippingly secure a conductor cable therebetween.

4,153,327

CONNECTOR FOR TELEPHONE CORDS

David W. Johnson, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 5, 1978, Ser. No. 903,239
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—205 **6 Claims**



1. A connector for telephone cords for connecting end-to-end telephone line cords having miniature plugs at least on one end, comprising:

a central body member;

a plurality of conductors extending end-to-end along the lower part of said body member and including end portions extending up and over each end of the body member, ends of the conductors extending part way over a top part of the body member;

a top member fitting over the top part of said central body member and including conductor alignment members for positioning the ends of said conductors;

a cover extending over the lower part of said central body member;

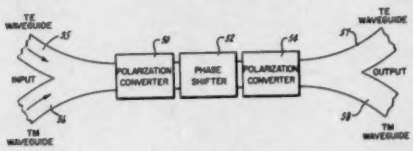
a profiled wall at each end of the connector defining an aperture at each end, each aperture profiled to accept one of said miniature plugs, contacts on said plugs aligned with and engaging with the ends of said conductors on full insertion of said plugs.

4,153,328

POLARIZATION CONVERTER AND CIRCUIT ELEMENTS FOR USE IN OPTICAL WAVEGUIDES

Shyh Wang, El Cerrito, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 296,238, Oct. 10, 1972, abandoned.
This application May 13, 1974, Ser. No. 469,220
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.11 **6 Claims**



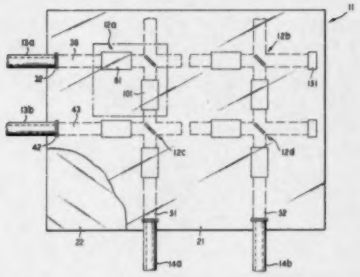
1. An optical waveguide gyrator, a first mode converter, a second mode converter selected to form a complementary pair with said first converter, means forming an optical waveguide interconnecting said converter, a first optical waveguide pair forming a branched input to said first mode converter and constructed and arranged for selectively propagating TE waves in one branch and TM waves in the other branch, and a second optical waveguide pair forming a branched output from said second mode converter and constructed and arranged for propagating TE waves in one branch and TM waves in the other branch.

4,153,329

OPTICAL CROSSPOINT SWITCH HAVING MODE-CONVERSION FACILITIES

Dean Gillette, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 25, 1977, Ser. No. 818,670
Int. Cl.[2] G02B *5/14*; G02F *1/09*
U.S. Cl. 350—96.13 **9 Claims**



1. In an apparatus for controlling the direction of wave energy through a crosspoint of a pair of crossed optical wave guiding channels, each channel being supportive of optical wave energy in at least first and second modes:

mode-sensitive means associated with the crosspoint and responsive to the incidence thereon of optical wave energy from one of the channels in the first mode for directing such wave energy into the other of the channels;

mode switching means disposed in each of the channels in mode coupling relation to the directing means and operable for converting wave energy, incident thereon in one of the first and second modes, into the other of the first and second modes; and

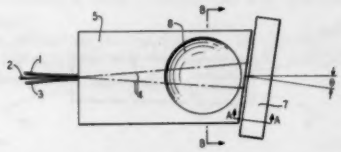
means for operating the mode switching means.

4,153,330

SINGLE-MODE WAVELENGTH DIVISION OPTICAL MULTIPLEXER

Walter J. Tomlinson, III, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 1, 1977, Ser. No. 856,280
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.17 10 Claims



1. A single-mode optical multiplexer comprising:
a thin-film optical waveguide mounted on a substrate and having a first edge and a second edge,
a single-mode output optical fiber coupled to said first edge,
at least two means for coupling optical radiation into said first edge,
means, located between said first edge and said second edge, for collimating input light emerging from said at least two means for coupling optical radiation into said first edge, and for focusing collimated light entering from said second edge into said output optical fiber, and
a reflection diffraction grating adjacent to said second edge for reflecting input light back through said collimating and focusing means into said output fiber.

4,153,331

FIBER OPTIC INTERFACE JUNCTION ASSEMBLY

Michael A. Cross, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1977, Ser. No. 800,119
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.20 7 Claims

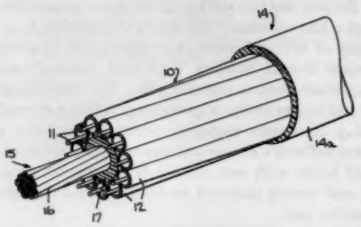
1. A fiber optic interface junction assembly comprising:
an optical element having a planar optical interface surface,
an optical fiber having a straight unsheathed length portion with an end in contact with said interface surface and extending perpendicularly therefrom to an extended portion encased in an elastic sheath in sliding fit with said fiber,
anchor means for anchoring a forward part of said sheath against movement without preventing slidability of such fiber therein, and
means for effecting mechanical coupling of said sheath to said fiber a distance from said anchored forward part whereby initial displacement of said unsheathed fiber into said sheath causes longitudinal stretching of said sheath for maintaining a bias force between said unsheathed fiber end and said interface surface.

4,153,332

SHEATHED OPTICAL FIBER ELEMENT AND CABLE

Sergio Longoni, Milan, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed Jun. 4, 1975, Ser. No. 583,780
Claims priority, application Italy, Jul. 30, 1974, 25702 A/74; Mar. 12, 1975, 21154 A/75
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.23 13 Claims



1. A unitary, signal modulated light transmitting, optical fiber element for telecommunication cables comprising a flexible, tubular non-metallic sheath and at least one light transmitting, optical fiber loosely received within and unsecured throughout its length and its ends to said sheath so that it is free to move both longitudinally as a whole and transversely to said sheath and adopt a shape providing minimum stress thereon, each said fiber having a solid central core of light transmitting material coated with a layer of solid material having an index of refraction smaller than the index of refraction of said core and said fiber having a minimum bending radius whereby bending of said fiber in a smaller radius will cause rupture of the fiber, said sheath having an empty inner longitudinal bore in which said fiber is received which is unobstructed for a minimum diameter larger than the diameter of a circle required to circumscribe all fibers within said bore and the unstretched, linear length of all said fibers within said bore being greater than the unstretched, linear length of said bore therearound but less than a linear length which will cause said fibers to bend to a radius less than said minimum radius when within said bore, whereby said fibers follow undulate paths within the sheath and contact the inner wall thereof and when said element is subjected to bending or elongation stresses the fiber or fibers are free to move transversely of said bore and said sheath can elongate without increasing the length of the fiber or fibers with respect to said linear length thereof thereby increasing the stresses to which said element may be subjected without rupturing the fiber or fibers.

4,153,333

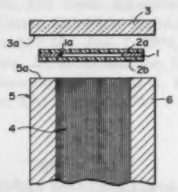
OPTICAL FIBER BUNDLE WITH FIELD STOP

Yuho Harada; Kenzo Hiramatu; Katsuhito Hasegawa, and Kuniaki Ishibashi, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Feb. 23, 1977, Ser. No. 771,348
Claims priority, application Japan, Feb. 23, 1976, 51-18610
Int. Cl.[2] G02B 5/17
U.S. Cl. 350—96.25 3 Claims

1. In an optical fiber bundle comprising a stack of optical fibers an end of which is precisely polished to provide a flat end face, a face plate having a flat surface and made of transparent material fixed to said end face of the optical fibers, and a field stop fixed between said end face of the optical fibers and said face plate, the improvement which comprises a pair of

transparent films sandwiching said field stop therebetween and fixed to said field stop by means of an adhesive, one of said pair



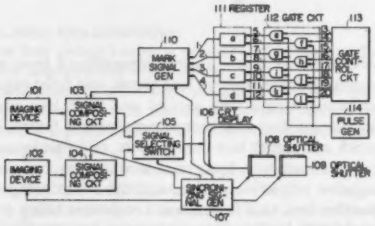
of transparent films being fixed between said end face of the optical fibers and said field stop by means of an adhesive.

4,153,334

STEREOSCOPIC IMAGE OBSERVING APPARATUS

Yasuo Kato, Kodaira; Tsutomu Komoda, Tokyo, and Teruichi Tomura, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 1, 1977, Ser. No. 802,436
Claims priority, application Japan, Jun. 9, 1976, 51-66538
Int. Cl.[2] G02B *27/22*
U.S. Cl. 350—132 **5 Claims**



1. In an apparatus for observing the stereoscopic image of an object to-be-observed by the use of a left eye image and a right eye image which are obtained by imaging an identical field of view on the object to-be-observed in two directions different from each other, a stereoscopic image observing apparatus comprising means for indicating one mark on each of said left eye image and said right eye image, means for moving both the marks on the respective images interlockingly with each other, and means for releasing the interlocking and moving only one of said marks.

4,153,335

METHOD AND APPARATUS FOR INCREASING THE VISIBILITY OF LOW-CONTRAST IMAGES

William R. Buchan, Lincoln, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Aug. 1, 1977, Ser. No. 820,524
Int. Cl.[2] G02B *27/00*
U.S. Cl. 350—150 **12 Claims**

4. Apparatus for increasing the visibility of a first area of an object which differs in brightness from a second area of said object, said apparatus comprising:

a. an electro-optic photosensitive storage device having a photosensitive characteristic in which the conductance of the device varies as a function of the intensity of the radiation incident upon it, and an electro-optic birefringent characteristic in which the birefringence varies as a function of an electric field applied across it;

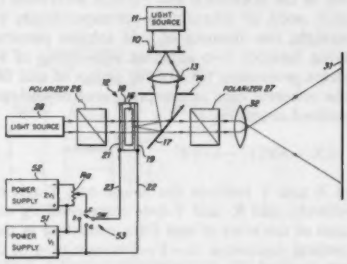
b. means for reading an image of said object into said electro-optic photosensitive device; and

c. means for reading said image out of said electro-optic photosensitive device and for projecting said read-out image onto an image receiving surface, said readout means including:

(1) means for producing a read-out beam of radiation;

(2) a pair of polarizer means;

(3) means for supporting said electro-optic photosensitive device between said pair of polarizer means in said read-out radiation beam; and



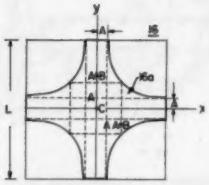
(4) optical retardation means between said polarizer means for cyclically varying the retardation in said read-out radiation beam whereby the brightness of the read-out image of said first area of said object will be caused to cyclically vary while the brightness of the read-out image of said second area of said object will remain constant.

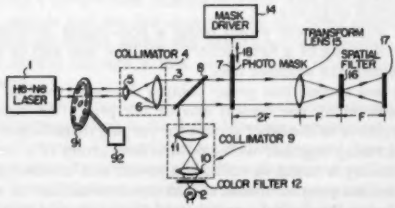
4,153,336

OPTIMIZED SPATIAL FILTER FOR DEFECT DETECTION

Masana Minami, Kawasaki, and Hidekazu Sekizawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 21, 1976, Ser. No. 752,984
Claims priority, application Japan, Dec. 22, 1975, 50/151951
Int. Cl.[2] G02B *27/38;* G01N *21/00*
U.S. Cl. 350—162 SF **10 Claims**





1. An apparatus for detecting defects in a pattern having linear straight line features and nonlinear defects comprising:

(a) a coherent light source for radiating a coherent light;

(b) a collimator for collimating the coherent light radiated from said coherent light source into a light beam with a predetermined diameter and leading it to said pattern;

(c) a transform lens for transforming the intensity distribution of transmitted or reflected light from said pattern into a Fourier-transformed pattern; and

(d) a spatial filter placed on the Fourier-transform plane of said transform lens and preventing transmission of the coherent light having information of said linear straight line features of said pattern, said filter having a light intercepting area defined by a plurality of arm sections extending in the horizontal and vertical directions from a common point of intersection correspondingly to the linear straight line features of said subject pattern, a portion lying between two adjacent arms being of a hyperbola-shape protruding toward the center of said filter wherein the coherent light intercepting area of said spatial filter is defined according to

$$(|X|-A)(|Y|-A) \leqq B^2$$

where X and Y indicate the X-axis and Y-axis of said filter respectively, said X- and Y-axes corresponding to the respective axes of the arms of said filter extending in the horizontal and vertical directions, $X=Y=0$ is indicative of the center of said filter, and both A and B are positive constants, wherein said constants A and B are given as values complying with

$$A \times B \geqq 1/64\ L$$

where L is the side length of an effective pupil or the diameter of an effective pupil of said spatial filter.

4,153,337

HIGH-POWER ZOOM PROJECTION OBJECTIVE

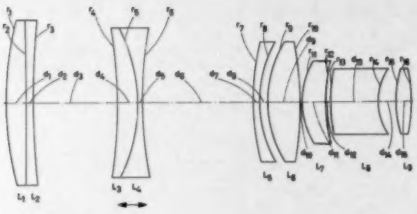
Xiem Guyen, Monnaz, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 31, 1977, Ser. No. 783,200

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614267

Int. Cl.[2] G02B *15/14*

U.S. Cl. 350—184 **3 Claims**



3. A high-power zoom projection objective comprising, in combination, a first lens group; a second lens group; and a main objective, said first lens group, said second lens group and said main objective being arranged in the stated order in the direction from the farther to the closer conjugate of the zoom projection objective,

(a) said first lens group being a convergent doublet and consisting of a first biconvex positive lens and of a first biconcave negative lens,

(b) said second lens group being a divergent doublet movable along the optical axis of the projection objective relative to the other groups for varying magnification and forming together with said first lens group of a variator having a negative refractive power and consisting of a second positive meniscus, the concave surface of which facing the farther conjugate of the projection objective, and of a second biconcave negative lens; and

(c) said main objective being convergent and comprising a plurality of lens elements the two of which closest to said second lens group together form a non cemented component lens system having a positive refractive power and consisting of a third forward negative meniscus the convex surface of which facing the farther conjugate of the projection objective and a third biconvex positive lens.

4,153,338

WIDE-ANGLE ZOOM LENS SYSTEM

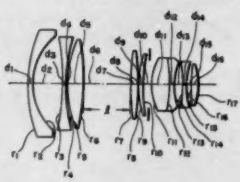
Toru Fujii, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1977, Ser. No. 806,825

Claims priority, application Japan, Jun. 17, 1976, 51/71339

Int. Cl.[2] G02B *15/16*

U.S. Cl. 350—184 **5 Claims**



1. A wide-angle zoom lens system comprising a front negative lens group and rear positive lens group, said front negative lens group comprising a first, second and third lens components, said rear positive lens group comprising a fourth, fifth, sixth, seventh and eighth lens components, said first lens component being a negative lens, said second lens component having negative refractive power, said third lens component being a positive lens, said fourth lens component being a positive lens, said fifth lens component being a positive lens, said sixth lens component being a positive cemented doublet, said seventh lens component being a negative lens, said eighth lens component being a positive lens, said wide-angle zoom lens system being arranged to be zoomed by varying the airspace between said front negative lens group and said rear positive lens group and to satisfy the following conditions:

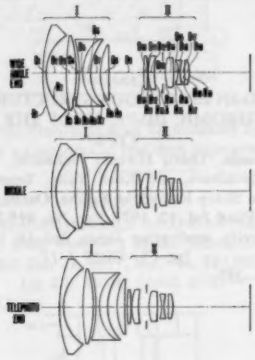
(1) $-2.0 \leqq f_F/f_R \leqq -1.45$
(2) $1.0 \leqq a/f_F \leqq 1.5$
(3) $-1.2 \leqq b/f_R \leqq -1.05$
(4) $0.5 \leqq f_1/f_F \leqq 0.95$
(5) $1.0 \leqq r_6/f_F \leqq 10$
(6) $0.65 \leqq f_{456}/f_R \leqq 1.0$
(7) $0.45 \leqq r_{15}/f_R \leqq 1.0$
(8) $0.5 \leqq f_8/f_R \leqq 1.1$
(9) $50 \leqq \nu_1$

wherein reference symbol f_F represents the focal length of the front lens group, reference symbol f_R represents the focal length of the rear lens group, reference symbol f_1 represents the focal length of the first lens component, reference symbol f_{456} represents the total focal length of the fourth, fifth and sixth lens components, reference symbol f_8 represents the focal length of the eighth lens component, reference symbol a represents the distance from the final surface of the front lens group to the back focal point of the front lens group, reference symbol b represents the distance from the front surface of the rear lens group to the front focal point of the rear lens group, reference symbol r_6 represents the radius of curvature of the surface on the image side of the third lens component, reference symbol r_{15} represent the radius of curvature of the surface on the image side of the seventh lens component, and reference symbol ν_1 represents Abbe's number of the first lens component.

4,153,339
ZOOM LENS

Akira Tajima, Kawasaki, and Naoto Kawamura, Iragi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 692,034, Jun. 2, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,064
Claims priority, application Japan, Jun. 6, 1975, 50/68764
Int. Cl.[2] G02B *15/16*
U.S. Cl. 350—184 **2 Claims**



1. A zoom lens comprising:
a first lens group having a plurality of lenses and having a total negative refractive power;
a second lens group having a plurality of lenses, a diaphragm incorporated therein and a total positive refractive power and being positioned closer to an image plane than the first lens group;
means for varying the distance between the first lens group and the second lens group for zooming;
a first aspheric surface having a positive 3rd-order aspheric coefficient and being positioned at the 1-th surface of the first lens group; and
a second aspheric surface having a negative 3rd-order aspheric coefficient and being positioned at the j-th surface closer to the image plane than the diaphragm of the second lens group;
in which the following condition is satisfied

$$\Delta Vi+\Delta Vj<0$$

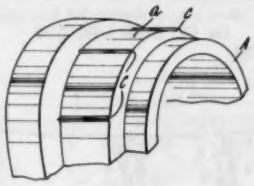
where ΔVi represents changes in the 3rd-order distortion aberration caused by the first aspherical surface and ΔVj represents changes in the 3rd-order distortion aspherical surface caused by the second aspherical surface.

4,153,340
CONSTRUCTION OF PARTS PROVIDING FITS

Kyozo Uesugi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1976, Ser. No. 736,021
Claims priority, application Japan, Nov. 12, 1975, 50/136573
Int. Cl.[2] G02B *7/02*
U.S. Cl. 350—252 **19 Claims**

1. An interfitting parts assembly comprising:
a female member having a bore with a first continuous peripheral face;
a male member fitted in said bore with a clearance fit and having a second continuous peripheral face confronting and spaced from said first continuous peripheral face to delineate a clearance equally around the face of the male member;
a plurality of equally circumferentially spaced projecting portions, the heights of which do not exceed one and one half the maximum of said clearance between said first and second faces formed on one of said faces and having a mechanical strength lower than that of said members, whereby said clearance is at least reduced with the interfitting of said members;
the height of said projecting portions being greater in dimension than the minimum clearance between said first and second faces;
a portion of one of said members at an initial engaging end

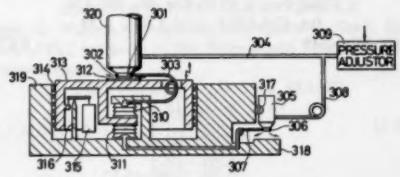


being formed with a tapered portion for facilitating the assembly of said members whereby there is provided a cavity delineated by said tapered portion for trapping cutting-chips of said projecting portions therein attendant to the assembly of said members;
said projecting portions being in the form of linear ridges parallel with the longitudinal direction of said male member.

4,153,341
AUTOMATIC FOCUSING APPARATUS

Yoshio Kawamura, and Shigeo Moriyama, both of Kokubnji, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 31, 1977, Ser. No. 783,141
Claims priority, application Japan, Apr. 2, 1976, 51-36002
Int. Cl.[2] G02B *7/11*
U.S. Cl. 350—255 **25 Claims**



1. An automatic focusing apparatus for positioning a sample at a predetermined focal position of an optical system, comprising:
mounting means for mounting the sample;
first detector means, coupled to the optical system, for detecting a gas pressure relative to a gap distance between the sample and the first detector, the gas being supplied from a gas supply source and jetted toward the surface of the sample through a first orifice of the first detector means;
second detector means, for detecting a reference gas pressure corresponding to the desired focusing position of said optical system by supplying a gas thereinto and then jetting it toward a reference plate through a second orifice of the second detector means, the reference pressure being adjustable by varying a gap distance between the second orifice and the reference plate,
control means for controlling and driving the mounting means in response to a pressure difference between the gas pressure detected by the first detector means and the reference gas pressure detected by the second means; and
supporting means for supporting the mounting means, the

mounting means being movable by the supporting means in response to the control means.

4,153,342

SIDE VIEW MIRROR WITH INVERTING SPINDLE

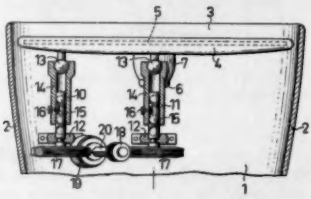
Bernhard Mittelhäuser, No. 57, D-3002, Wedemark, 2, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 852,988

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2652978

Int. Cl.[2] G02B *5/08, 7/18*

U.S. Cl. 350—289 **8 Claims**



1. In a side view mirror arrangement for motor vehicles including:

a mirror holding means with a motor drivingly connected thereto by interconnecting means therebetween having the improvement in combination therewith comprising one adjusting means including an inverting spindle with crisscrossing left hand and right hand threads, and a further adjusting means including a sleeve with a pin for engaging said threads of said spindle.

4,153,343

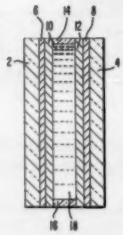
LIQUID CRYSTAL DYESTUFFS AND ELECTRO-OPTIC DEVICES INCORPORATING SAME

Allen Bloom, East Windsor, and Ling K. Hung, Edison, both of N.J., assignors to RCA Corporation, New York, N.Y.

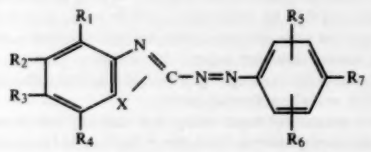
Filed Jun. 9, 1977, Ser. No. 805,154

Int. Cl.[2] G02F *1/13*; C09K *3/34*

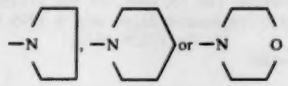
U.S. Cl. 350—349 **6 Claims**



1. In an electro-optic device field effect liquid comprising a crystal neamtic liquid crystal composition havng positive dielectric anistropy between two electrodes, the improvement which comprises a dyestuff dissolved in said composition of the formula



wherein R_1 to R_4 independently at each occurrence can be hydrogen, fluoro, chloro, bromo, alkoxy, cyano, nitro or dialkylamino or any adjacent two of R_1 to R_4 together can be part of an aromatic ring; X can be NH, NCH_3, S or O; R_5 and R_6 independently can be hydrogen, fluoro, chloro, bromo, or lower alkyl; and R_7 can be alkoxy, dialkylamino,



4,153,344

LEAD-IN ELECTRODE STRUCTURE FOR ELECTROCHROMIC DISPLAYS OF THE SEGMENTED TYPE

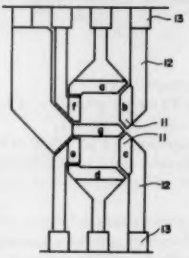
Hiroshi Hamada, Tenri; Hiroshi Nakauchi, Nara; Tadanori Hishida, Kashihara, and Kozo Yano, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 13, 1977, Ser. No. 815,262

Claims priority, application Japan, Jul. 16, 1976, 51-85430

Int. Cl.[2] G02F *1/17*

U.S. Cl. 350—357 **3 Claims**



1. In an electrochromic display device including two substrates, display segments formed on one of said two substrates, a counter electrode formed on the other of said two substrates, and an electrochromic material for coloring said display segments upon receiving a predetermined current or voltage, the improvement comprising:

terminals formed on said one of said two substrates for connecting the electrochromic display device to a driver circuit; and

lead-in electrodes for connecting said display segments to corresponding terminals, said lead-in electrodes being shaped in such a manner as to have resistance values inversely proportional to the size of the corresponding display segments.

4,153,345

ELECTROLYTIC DISPLAY DEVICE

Jacques Duchéne, Grenoble, and Robert Meyer, Gieres, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 16, 1977, Ser. No. 797,261

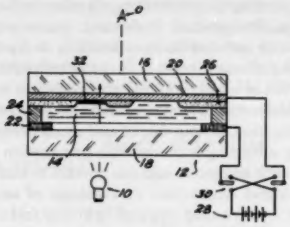
Claims priority, application France, May 19, 1976, 76 15103

Int. Cl.[2] G02F *1/17*

U.S. Cl. 350—363 **6 Claims**

1. In an electrolytic display device of the type comprising a light source for illuminating a cell formed: by an electrolyte containing metallic ions interposed between a first wall coated with a first transparent conductive film-layer forming an electrode having a suitable shape for display and a second wall coated with a second conductive film-layer forming a counter-electrode, and by means for supplying electric current to said electrodes in order to induce deposition or dissolution of a

deposited metallic film-layer on said electrode by electrochemical reaction from said ions; the improvement wherein said



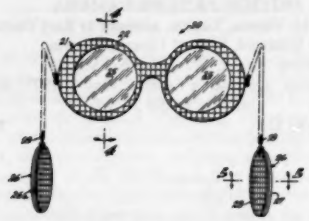
deposited metallic film-layer is an illuminating light-absorbent thin film having a thickness of less than approximately 10 nm.

4,153,346

COMBINED SUNGLASSES AND EAR PENDANTS

Bernard Gomer, 8000 West Dr., Miami Beach, Fla. 33141

Filed Jul. 22, 1977, Ser. No. 817,917
Int. Cl.[2] G02C *11/02, 3/00*
U.S. Cl. 351—52 **1 Claim**



1. A combined sunglasses and ear pendants adornment comprising an eyeglass frame mounting lenses therein, a pair of flexible cord-like temple members attached to opposite sides of the frame, a decorative pendant terminating each temple member, said temple members being adapted to extend over and behind the ears of a wearer and to suspend the decorative pendants behind and below the ear lobes, said eyeglass frame being formed as a pair of front and rear mating halves, a decorative sheet sandwiched therebetween, said front mating half being transparent whereby the design of the decorative sheet is visible therethrough and provides the design for the frame, each of said pendants being formed as transparent mating halves, a decorative sheet sandwiched between said pendant mating halves, said mating halves of the eyeglass frame and pendants being integrally formed with snap-in/snap-out means to permit separation of said mating halves for changing the decorative sheets therebetween and for reassembly of the frame and pendants with other decorative sheets, said mating halves of said eyeglass frame and pendants having edge portions formed with grooves between said mating halves to accommodate a prying instrument to effect said snap-in/snap-out separation.

4,153,347

EYEGLASS FRAMES WITH REMOVABLE, INTERCHANGEABLE LENSES, RIMS AND TEMPLE PIECES

C. Randolph Myer, P.O. Box 254, Beverly Farms, Mass. 01915

Filed Jun. 8, 1977, Ser. No. 804,789
Int. Cl.[2] G02C *1/08*
U.S. Cl. 351—90 **21 Claims**

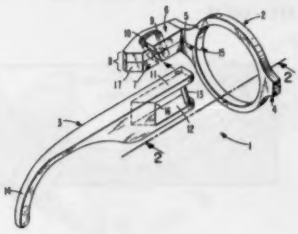
15. A pair of eyeglass frames comprising:

right and left lens rims joined to each other, each of said rims bearing a mounting lug at a point generally opposite the point where it is joined to the other rim;

pivot pin seating means in each lug comprising a pin receiving aperture extending through the lug from top to bottom;

entry channel means in each lug comprising an open slot extending through the lug from top to bottom and leading from the periphery of the lug to the pin receiving aperture, at least a portion of said slot being inclined from vertical;

a pair of right and left temple pieces each having an upper



mounting arm and a lower mounting arm projecting from the rim end thereof, said upper and lower mounting arms being spaced apart a distance corresponding to the height of the lug, and

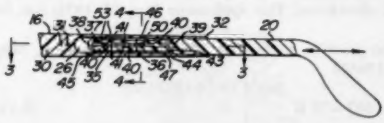
pivot pin means comprising an inclined pin mounted between the upper and lower mounting arms of each temple piece, said pin being physically oriented to pass through the entry channel means in one of the lugs only when the temple piece in which the pin is mounted is oriented at one particular angle with respect to the adjacent rim, said pin and said aperture being configured such that the pin will seat in the pin receiving aperture.

4,153,348

ADJUSTABLE EYEGLASS TEMPLE

Eugene G. Walters, Orwigsburg, and Heinz E. Ruck, Morton, both of Pa., assignors to The Fibre-Metal Products Company, Concordville, Pa.

Filed Jul. 5, 1977, Ser. No. 812,827
Int. Cl.[2] G02C *5/20*
U.S. Cl. 351—118 **10 Claims**



1. A pair of elongated members adapted for longitudinal adjusting movement relative to one another, a slotted opening in one of said members with a plurality of longitudinally spaced enlarged pocket portions, a pin mounted in a fixed position in the other member engaging through said slotted opening which seats in a selected one of said enlarged pocket portions of said slot to releasably retain said members in a selected position, said slot between said enlarged pocket portions being smaller in cross section than the cross section of the pin, said members being of a predetermined cross sectional relationship to permit flexing displacement of said other member upon longitudinal adjusting movement of said members relative to one another to permit positioning of said pin in a selected pocket portion of said slot, said slotted opening being resiliently yieldable for said pin movement and snap pin enlargement in said enlarged pocket portions.

4,153,349
SOFT CONTACT LENS WITH THIN EDGE

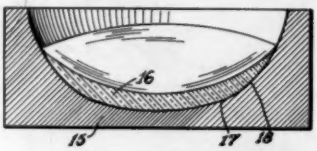
Otto Wichterle, Prague, Czechoslovakia, assignor to NPD Technologies, Inc., Las Vegas, Nev.

Continuation of Ser. No. 186,800, Oct. 5, 1971, abandoned, which is a continuation of Ser. No. 827,092, May 12, 1969, abandoned, which is a continuation of Ser. No. 318,627, Oct. 24, 1963, abandoned, which is a continuation-in-part of Ser. No. 229,727, Oct. 10, 1962, abandoned. This application Oct. 30, 1974, Ser. No. 519,383

The portion of the term of this patent subsequent to Jan. 2, 1985, has been disclaimed.

Int. Cl.[2] G02C *7/04*

U.S. Cl. 351—160 H 18 Claims



1. A sparingly cross-linked polymeric hydrogel in the shape of a corneal contact lens;

(a) said lens being contained in physiological saline solution and in osmotic equilibrium therewith thereby attaining its final dimensions;

(b) said lens being chemically and dimensionally stable while so contained in said physiological saline solution and under conditions of use as a contact lens;

(c) said lens after attaining its final dimensions being characterized by good optical quality, full transparency, softness, resiliency, and an inner concave surface and outer convex surface which meet in a thin edge such that when said lens is positioned on the cornea of the eye it blends smoothly with the corneal surface thereof without any sudden step at the boundary of the cornea and lens surfaces.

4,153,350
RECHARGEABLE MAGAZINE FOR MOTION PICTURE FILM

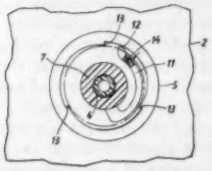
Rudolf Blank, Cologne-Dünnwald, and Achim Kluczynski, Porz-Eil, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 417,182, Nov. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 256,913, May 25, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 641,161

Claims priority, application Fed. Rep. of Germany, May 28, 1971, 2126636

Int. Cl.[2] G03B *23/02*

U.S. Cl. 352—78 R 29 Claims



1. A rechargeable magazine for roll film, particularly for 8-millimeter motion picture film, comprising a housing member defining a chamber for a supply of convoluted film; a core member rotatably mounted in said housing member to support the convoluted film in said chamber; blocking means including a first portion arranged to rotate with said core member and a second portion provided in said housing member in the path of movement of said first portion to thereby normally prevent rotation of said core member in one direction, at least one of said portions being movable relative to the other portion to an inoperative position in which said first portion is free to bypass said second portion to thus permit a rotation of said core member in said one direction, at least one of said members having at least one opening affording access to said one portion so as to enable a tool to reach and move said one portion to said inoperative position without destruction or breakage of said members; and means for preventing entry of light into said chamber by way of said opening.

4,153,351
MOTION-PICTURE CAMERA

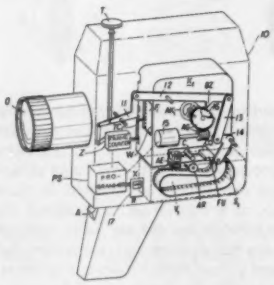
Friedrich Stöckl, Vienna, Austria, assignor to Karl Vockenhuber and Hauser Raimund, both of Vienna, Austria

Filed May 1, 1978, Ser. No. 901,711

Claims priority, application Austria, May 2, 1977, 3074/77

Int. Cl.[2] G03B *21/36*

U.S. Cl. 352—91 C 8 Claims



1. A motion-picture camera having a housing which forms a compartment adapted to receive a cassette with at least one exposure gap giving access to a film for the recordal of information thereon, reversible transport means engageable at said exposure gaps with the film of a cassette inserted in said compartment for intermittently advancing said film, switchover means operatively coupled with said transport means for optionally changing the advance of said film from a normal forward direction to a rearward direction, and drive means engageable with a windup reel in said cassette,

the combination therewith of control means in said housing selectively operable during a first phase of a trick shot for at least retarding the re-entry of said film into said cassette from said exposure gap, with resulting accumulation of excess film downstream of said transport means in said compartment, and guide means in said housing for directing at least part of said excess film into a predetermined storage space adjacent said exposure gap but separated from said transport means to enable a subsequent withdrawal thereof during a second phase of a trick shot upon operation of said switchover means.

4,153,352
ALTERED NEGATIVE-FEEDBACK DIAPHRAGM CONTROL DURING IMPLEMENTATION OF IMAGE FADEOVER IN A MOTION-PICTURE CAMERA

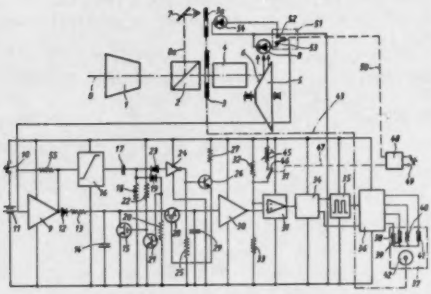
Kurt Borowski, Aschheim; Friedrich Stumpf, and Theodor Huber, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed May 10, 1978, Ser. No. 904,554

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721569

Int. Cl.[2] G03B *21/36*

U.S. Cl. 352—91 C **6 Claims**



1. A motion-picture camera capable of implementing fade-out, fade-in and/or fadeover transition effects, the camera comprising a camera objective; an adjustable diaphragm cooperating with the camera objective; negative-feedback diaphragm control means operative for controlling the diaphragm aperture, the control means including a diaphragm-adjusting motor coupled to the diaphragm, first photosensitive means positioned to receive light passing through the objective for generating a light-dependent signal, means for deriving from the light-dependent signal an analog aperture-error signal, and means for deriving from the analog aperture-error signal a digital control signal controlling the operation of the diaphragm-adjusting motor; and transition-implementing means activatable by the user for implementing a transition effect and operative when activated for disturbing the equilibrium of the negative-feedback diaphragm control means in a sense causing the diaphragm aperture to decrease by a predetermined amount, the transition-implementing means including an auxiliary light attenuator coupled to the diaphragm and to the diaphragm-adjusting motor and located with its front exposed to ambient scene light, second photosensitive means positioned behind the auxiliary light attenuator to receive ambient scene light through the auxiliary light attenuator, switchover means operative for disconnecting the first photosensitive means from the negative-feedback diaphragm control means and connecting the second photosensitive means into the negative-feedback diaphragm control means, and compensating means operative for redefining the equilibrium state of the negative-feedback diaphragm control means to correct for the difference between the light incident upon the second as opposed to the first phorosensitive means.

4,153,353
FILM TRANSPORT FOR A VIEWER

Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 30, 1977, Ser. No. 865,791

Int. Cl.[2] G03B *23/14*

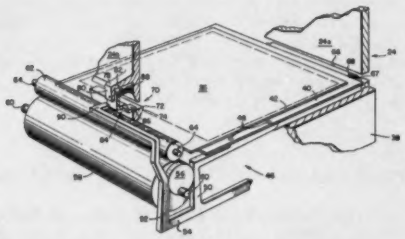
U.S. Cl. 353—114 **6 Claims**

1. Apparatus for sequentially presenting photographs at a projection position whereat their images may be transmitted onto a viewing screen, said apparatus comprising:

means for defining a chamber for receiving a stack of photographs, said chamber defining means including means for preventing an endmost photograph in the stack from moving completely into a projection plane during loading of the stack of photographs into said chamber and means defining an exit through which a photograph is adapted to be advanced out of said chamber;

means for moving a leading edge of the endmost photograph out of engagement with said preventing means and partially out of engagement with the next adjacent photograph in the stack and substantially into the projection plane wherein only the trailing ends of the endmost and next adjacent photographs are in contact with each other;

means for advancing the endmost photograph in the direction of its leading edge along the projection plane into a projection position while said preventing means maintains the next adjacent photograph partially out of engagement therewith thereby substantially obviating any problem of the endmost and the next adjacent photographs damaging each other during said movement of the endmost photograph along the projection plane, said advancing means including means adapted to engage the endmost photograph by its edge prior to moving it into and away from the projection position; and



means for transmitting the image of the endmost photograph supported at the projection position onto the viewing screen.

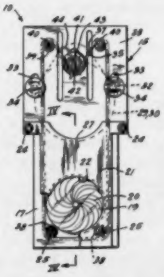
4,153,354
ANIMATED VISUAL EFFECT ADAPTOR FOR PROJECTORS

William G. Gugeler, 200 S. Vance, Lombard, Ill. 60148

Filed Jul. 18, 1977, Ser. No. 816,457

Int. Cl.[2] G03B *41/08*

U.S. Cl. 353—122 **12 Claims**



1. An animated visual effect adaptor unit for a still picture projector which has a projection gate between a light beam source and a projection lens system, comprising:

an elongate support structure having a first portion dimensioned to be received removably in the projection gate and having a projection aperture for passage of the beam from the source and thence through the lens system onto a projection surface;

said support structure having a second portion which re-

mains outside of the projection gate when said first portion is received in the projection gate;

power means attached to said second portion;

a rotary translucent disk located across said aperture and carrying projectable visual effect design for projection of said design by passing of the light beam through said aperture and said disk;

a driving coupling between said power means and said disk including an endless flexible driving element extending from driven connection with said power means into driving connection with said disk for rotating the disk to produce an animated effect of the projected design;

means carried by said first portion of the support structure adjacent to that end of the first portion which is remote from said second portion, and clear of said aperture for guiding said endless flexible driving element to run about said disk;

and friction means motivated by said flexible driving element and engaged by the perimeter of said disk to effect positive rotation of the disk.

4,153,355

CAMERA INCORPORATED WITH A MOVABLE FLASH LIGHT DEVICE

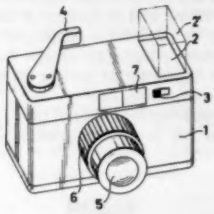
Kazuo Ikawa, Tokyo; Michio Hirohata, Kawasaki; Mutsuhide Matsuda, Yokohama, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 830,708

Claims priority, application Japan, Sep. 7, 1976, 51-106885

Int. Cl.[2] G03B *15/05*

U.S. Cl. 354—33 **4 Claims**



1. A camera incorporating a movable flash unit therein, the camera comprising:

a camera body,

said movable flash unit being shiftable between a protruding position in which the flash unit protrudes outside of said camera body and a stowed position in which the flash light device is stowed within the camera body,

a discharge tube incorporated in said flash light device to emit a flash toward an object to be photographed, said discharge tube being arranged to be located outside of said camera body when said flash unit shifts to the protruding position and to be located within said camera body when the flash unit shifts to said stowed position,

a capacitor for providing energy so said discharge tube can emit flashes of light,

exposure determining means which determines exposures in accordance with received signals,

daylight exposure control means for producing an electrical signal corresponding to the brightness of the object to be photographed, said daylight exposure degree control means being arranged to supply the electrical signal to said exposure determining means,

flash exposure degree control means for producing an electrical signal corresponding to the guide number of the flash unit and supplies the electrical signal to said exposure determining means,

switching means shiftable between a first position in which said flash exposure control means is rendered operable and a second position in which the flash exposure control means is rendered inoperative, said switching means being arranged to shift to the first position when said flash unit shifts to the protruding position and to shift to the second position when the flash unit shifts to the stowed position,

operation means for causing said switching means to shift from the first position to the second position when said flash unit is shifted to the protruding position, and

means for forming a discharge circuit for said capacitor when said switching means is shifted to the second position and for discharging the electric charge of said capacitor through said switching means in said second position.

4,153,356

LIGHT SOURCE APPARATUS FOR ENDOSCOPE

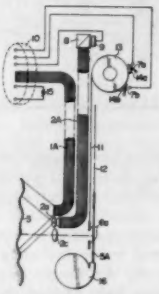
Hiroyuki Hama, Higashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1977, Ser. No. 833,493

Claims priority, application Japan, Sep. 16, 1976, 51-110973

Int. Cl.[2] G03B *29/00*; A61B *1/04*

U.S. Cl. 354—62 **15 Claims**



1. A connector assembly for use with endoscopes and the like especially adapted for accomodating a variety of different types of endoscopes including fiberscopes and gastrocameras with and without a shutter and a viewfinder, each of said endoscopes including a branch circuit having an electrical impedance identifying the type of endoscope, said connector assembly comprising:

discriminator means separately connectable with the branch circuits of said endoscopes, said descriminator means being responsive to the electrical impedance of the branch circuit to which it is connected for developing an electrical signal representative of the type of endoscope to which it is connected.

8. A light source apparatus for endoscopes and the like comprising a discharge lamp as a light source, an optical system for causing an output light beam from the lamp to impinge on a bundle of optical fibres of an endoscope which transmit illuminating light, lamp current control means for selectively establishing a lamp current at one of three levels comprising a maximum level, a minimum level and an intermediate level, switching means for switching the lamp current from a normal value to the maximum level in synchronism with the initiation of an exposure given to a photographic film, means for initiating the calculation of an exposure given to the film in synchronism with the initiation of the exposure thereto and for producing an exposure stop signal when the exposure given to the film reaches a given value, means for switching the lamp current from the maximum level to the minimum level and for moving a light shield member into the path of said illuminating light in response to the exposure stop signal, the light source apparatus being adapted to be connected with any one of a variety of endoscopes using different exposure techniques and synchronization techniques, including a fibrescope with external camera, a gastrocamera having shutter and viewfinder, and a gastrocamera having no shutter and viewfinder, and mode selection means responsive to an electrical feature of the particular

endoscope connected with the apparatus to establish automatically a suitable exposure and synchronization technique for a selected endoscope, said mode selection means being operable when the fibrescope is connected with the apparatus for a normal viewing operation to establish the lamp current at an intermediate level, said mode selection means being operable when a gastrocamera having shutter and viewfinder is connected with the appartus for a normal viewing operation to establish the lamp current at an intermediate level and operable to interrupt the illumination in the course of opening of the shutter by moving the light shield member into the path of illuminating light, said mode selection means being operable when a gastrocamera having no shutter and viewfinder is connected with the apparatus to establish the lamp current at the minimum level and to interrupt the illumination by moving the light shield member into the path of illuminating light.

4,153,357
UNDERWATER CAMERA

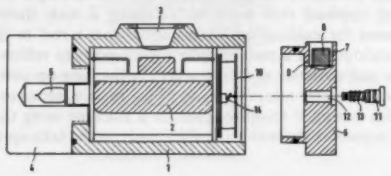
Helmut Winnacker, Burgdorf, and Jurgen Dierssen, Barsinghausen, both of Fed. Rep. of Germany, assignors to Preussag Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 22, 1977, Ser. No. 835,436

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650524

Int. Cl.[2] G03B *17/08*; G01S *9/66*

U.S. Cl. 354—64 **10 Claims**



1. An underwater camera including a pressure tight housing having a camera therein and a release mechanism for releasing the camera shutter at a predetermined distance from the sea bed, the improvement in said release mechanism comprising:

electro-acoustic transducer means on the exterior of said housing for transmitting an ultrasonic signal and receiving an echo signal, and

electronic circuit means on the interior of said housing and communicating directly through said housing with said transducer means to generate said ultrasonic signal for transmission by said transducer and to automatically release said shutter in response to the echo signal received by said transducer when said predetermined distance is reached.

4,153,358
INFORMATION SETTING APPARATUS FOR CAMERAS

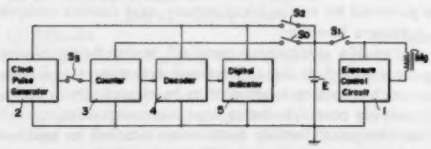
Seiji Yamada, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 26, 1977, Ser. No. 819,063

Claims priority, application Japan, Aug. 3, 1976, 51-92959

Int. Cl.[2] G03B *17/18, 17/24*

U.S. Cl. 354—106 **13 Claims**



1. Information setting apparatus for a camera comprising:

means for generating pulses;

means for counting said pulses and including a plurality of counters;

means for visually displaying variable digital information represented by the pulse count in said means for counting and including a corresponding number of visual indicators;

means for decoding the pulse count to change the digital information displayed by said means for displaying in accordance with the pulse count stored in said counting means and including a corresponding number of decoders, each of said decoders changing the digital information indicated by a respective one of said corresponding number of visual indicators in accordance with the number of pulses stored in a respective one of said plurality of counters; and

manually operable means for initiating the pulse input to said counting means to optionally change the digital information displayed by said means for displaying, or for initiating and subsequently stopping the pulse input to said counting means to optionally fix the digital information displayed by said means for displaying.

4,153,359
COUPLING ARRANGEMENT FOR CAMERA AND FLASH UNIT

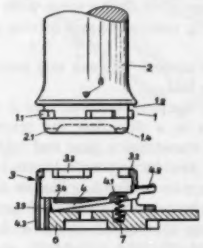
Hans E. Heintke, Wächtersbach; Hans Karey, Frankfurt, and Robert Oberheim, Liederbach, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 7, 1977, Ser. No. 831,332

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 7627876

Int. Cl.[2] G03B *15/02*

U.S. Cl. 354—126 **11 Claims**



1. A coupling arrangement for releasably coupling a flash unit with a camera unit, comprising a first coupling element adapted to be carried on one of said units; a second coupling element adapted to be carried on the other of said units and engageable with said first element for relative turning movement about an axis; cooperating coupling portions on said elements and together forming a bayonet coupling which connects said coupling elements in response to relative turning movement of the same about said axis in one direction, and releases said coupling elements in response to such relative turning movement about said axis in the opposite direction; and releasable arresting means for arresting said elements against relative movement when said elements assume a predetermined relative orientation in response to said turning movement in said one direction.

4,153,360

FOCAL PLANE SHUTTER FOR A CAMERA

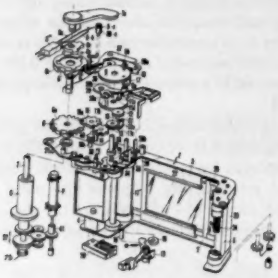
Noboru Kodaira, Tokyo; Nobuo Tezuka; Mitio Senuma, both of Tokyo; Teiji Hashimoto, Kawasaki; Masanori Uchidoi, Yokohama, and Yukio Iura, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1977, Ser. No. 764,287

Claims priority, application Japan, Feb. 5, 1976, 51-11688

Int. Cl.[2] G03B *9/28, 9/34*

U.S. Cl. 354—241 **1 Claim**



1. A focal plane shutter for a camera comprising:

(a) a shutter unit casing including a pair of base plates and supporting columns extending between said base plates;

(b) shutter plane means supported by said shutter unit casing;

(c) a rotatable body connected with said shutter plane means for winding up said shutter plane means to a charged position;

(d) a rotatable shutter driving spring connected with said shutter plane means, said shutter driving spring being charged for rotation in a direction reverse to the winding direction when said shutter means is wound up;

(e) holding means for holding said rotatable body when said shutter means is in said charged position;

(f) a driving shaft coupled with said rotatable body for winding up said vshutter means to said charge d position, and means for rotating said driving shaft;

(g) a driving gear fixed on said driving shaft for coupling said shaft to said rotatable body;

(h) a transmission gear cooperating with said driving gear for transmitting rotation of said driving gear to said rotatable body;

(i) clutch means carried between said transmission gear and said rotatable body;

(j) spring means coupled with said clutch means urging said clutch means in a direction for releasing engagement between said transmission gear and said rotatable body;

(k) said driving gear having teeth located on the circumferential periphery thereof and a plane section on the circumferential periphery spacing said teeth apart with said plane section having an angular extent at least equal to the angular extent of three side teeth so that engagement between said driving gear and said transmission gear is released when said rotatable body is held by said holding means, whereby said transmission gear and said clutch means rotate to an initial position under the influence of said spring means, said driving gear also having an abutment located on the circumferential periphery thereof and having an angular extent greater than the angular extent of one said tooth thereon said abutment located at one end of said plane section spacing said plane section from said teeth thereon, said abutment following said plane section in the direction of rotation of said driving gear, and said transmission gear having teeth on the circumferential periphery thereof and a plane section spacing said teeth thereon apart and said plane section having an angular extent corresponding to the angular extent of said abutment on said driving gear for securing initial engagement of said transmission gear with said driving gear for winding up.

4,153,361

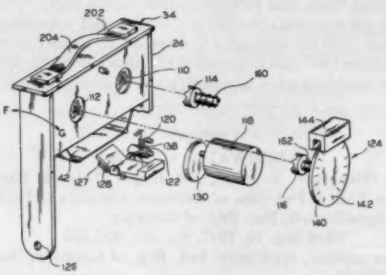
WEB CASSETTE WITH CARTRIDGE LOAD

Donald J. Axelrod, Glenview, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 4, 1977, Ser. No. 793,621

Int. Cl.[2] G11B *23/10;* **G03B** *17/00, 17/26, 27/32*

U.S. Cl. 354—275 **20 Claims**



1. A web cassette having a carrier plate with identical interchangeable supply and take-up cartridges mounted thereon, each of said cartridges containing a reel having a central hub and opposed reel sides for retaining a web therebetween, means for guiding said web pulled from a reel in the supply cartridge over a path including guide posts or rollers mounted on said cassette, and onto a reel in the take-up cartridge, V-tooth coupler means on each of the reels in order to interface with mating V-tooth couplers on a machine using the cassette to transport the web from the supply to the take-up cartridge.

4,153,362

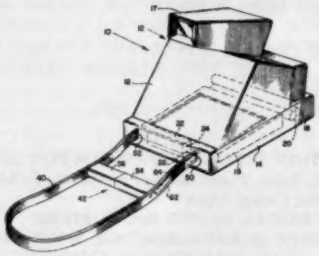
BATTERY OPERATED CAMERA HAVING MEANS FOR MOUNTING AN EXTERNAL BATTERY

Milton S. Dietz, Lexington, and William J. McCune, Jr., South Lincoln, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 1, 1977, Ser. No. 764,651

Int. Cl.[2] G03B *17/56*

U.S. Cl. 354—293 **6 Claims**



1. A camera having at least one component that is adapted to be powered by an electrical battery, said camera comprising:

a camera housing;

electrically conductive terminal means being electrically connected to the at least one component and to which such a battery is adapted to be electrically connected to supply power to the at least one component;

an elongated flexible neck strap coupled to said camera housing and being of sufficient length for a user to comfortably wear said camera about the neck, said neck strap having a central hollow core;

a relatively rigid hollow handle attached to said neck strap for providing a hand hold on said neck strap and for receiving and supportively enclosing such an electrical battery, said handle being positioned on said neck strap such that the user may alternatively hold onto said camera by grasping said handle or wear said camera about the neck, utilizing said neck strap, without interference from said handle; and

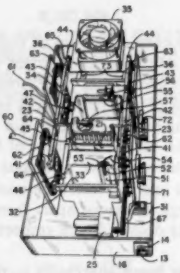
electrically conductive means for electrically connecting such a battery supportively enclosed by said handle to said terminal means of said camera, said electrically conductive means having a major portion thereof concealed within said hollow central core of a portion of said neck strap intermediate said handle and said camera housing.

4,153,363

BATCH DEVELOPING

Carlo J. Albano, Burlington, Mass., assignor to Cordell Engineering, Inc., Everett, Mass.

Filed Nov. 7, 1977, Ser. No. 849,224
Int. Cl.[2] G03D *3/10*
U.S. Cl. 354—299 **10 Claims**



1. Batch developing apparatus comprising,

developing tank means for holding a developing solution for developing film,

temperature sensing means for sensing the temperature of developer in said developing tank means and for providing a representative temperature signal,

means responsive to said temperature signal for controlling the developing time to be inversely proportional to the temperature of the developer in said developing tank means,

transport means for inserting into and removing from said developing tank means film to be developed,

and means responsive to said temperature signal for controlling said transport means and thereby control said developing interval.

4,153,364

EXPOSURE AND DEVELOPMENT CONTROL APPARATUS FOR ELECTROSTATIC COPYING MACHINE

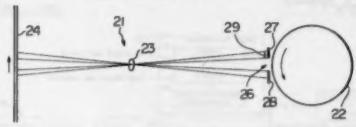
Koichi Suzuki, and Shigeru Suzuki, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 27, 1978, Ser. No. 873,152
Claims priority, application Japan, Jan. 28, 1977, 52-8391; Jan. 28, 1977, 52-8392; Jan. 28, 1977, 52-8393
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 **10 Claims**

1. In an electrostatic copying machine having optical means for scanning an original document and focussing a light image of a substantially linear portion of the document onto a moving photoconductive member to progressively form an electrostatic image of the entire document on the photoconductive member, an apparatus comprising;

a scanning linear photosensor array having a plurality of photoelectric sensor elements which are enabled in sequence to produce respective output signals having levels corresponding to incident light intensity, the photosensor array being disposed such that the light image is incident thereon;

first sensor means for detecting a maximum output level of the photosensor array;



second sensor means for detecting a minimum output level of the photosensor array; and

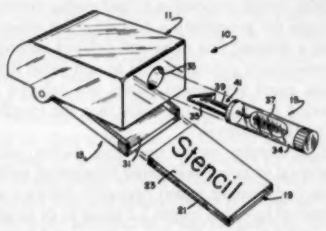
at least one variable operating parameter of the copying machine being controlled in accordance with the detected maximum and minimum output levels.

4,153,365

PORTABLE COPIER USING FLASH LAMP ARTICLE

George J. English, Reading, and Timothy Fohl, Carlisle, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 5, 1978, Ser. No. 893,723
Int. Cl.[2] G03B *27/04*
U.S. Cl. 355—99 **8 Claims**



1. A portable copier for exposing a sheet of photosensitized material through a stencil, said copier comprising:

a housing defining a chamber therein, said chamber including first and second opposing end portions;

a cover member movably oriented on said housing and adapted for forming a closure for said first end portion of said chamber, said cover member adapted for having said photosensitized sheet and said stencil located thereon whereby said sheet and stencil will be positioned adjacent said first end portion of said chamber when said cover member forms said closure therefor;

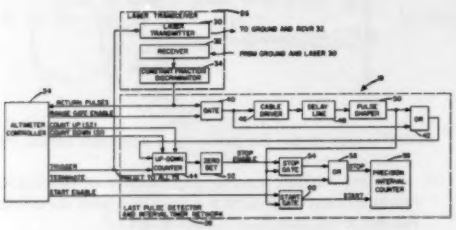
a flash lamp article adapted for being manually positioned within said second end portion of said chamber, said flash lamp article including a casing member and a chemical flash lamp positioned therein; and

activation means located within said second end portion of said chamber for activating said chemical flash lamp when said flash lamp article is positioned within said second end portion, the radiant energy from said flash lamp being directed toward said photosensitized sheet and stencil.

4,153,366
RANGEFINDING SYSTEM

Glenn Mamon, Chestnut Hill; Douglas G. Youmans, Watertown, and Jeffrey A. Volp, Billerica, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jun. 21, 1977, Ser. No. 808,461
Int. Cl.[2] G01C 3/08; H04B 1/04
U.S. Cl. 356—5 15 Claims



10. Laser rangefinding system comprising:

means to transmit at least one laser pulse from a reference point to a target,

means to detect at said reference point a first pulse sequence including a first pulse, said first pulse corresponding to said laser pulse, and further including n subsequent pulses, said subsequent pulses being reflections of said laser pulse, and

means for measuring the duration of said first pulse sequence comprising:

A. gating means for generating a gated pulse sequence including a gated first pulse and gated subsequent pulses respectively corresponding to said first pulse and ones of said n subsequent pulses occurring within a first time interval, said first time interval having a predetermined length L1 and including the last of said subsequent pulses,

B. delay means responsive to said gating means, said delay means for generating a delayed pulse sequence including a delayed first pulse and delayed subsequent pulses respectively corresponding to said gated first pulse and said gated subsequent pulses but delayed by a delay period Δ equal to or greater than the length L1 of said first time interval,

C. first counter means operative during said first time interval to count said gated subsequent pulses,

D. second counter means operative during a second time interval having a length L2 equal to or greater than the length L1 of said first time interval and including points in time displaced by Δ from the beginning and end of said first time interval, said second counter means including means to count said delayed subsequent pulses,

E. first detection means responsive to said delay means to detect the occurrence of said delayed first pulse and to generate a start control signal representative thereof,

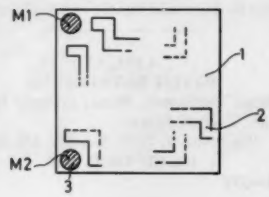
F. second detection means and associated gating means responsive to said first and second counter means to provide an enabling signal when said second counter means has counted the first n−1 of said delayed subsequent pulses, and said associated gating means being responsive to said enabling signal and said delay means to detect the occurrence of the last of said delayed subsequent pulses and to generate a stop control signal representative thereof,

G. interval timing means responsive to said start control signal to begin timing the duration of said second pulse sequence and to said stop control signal to terminate timing the duration of said second pulse sequence, the duration of said second pulse sequence being representative of the duration of said first pulse sequence.

4,153,367
METHOD AND DEVICES FOR LOCALIZING FLAT CHIPS ON A CARRIER PLATE

Christian Lietar, and Pierre Jeannin, both of Morges, Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,191
Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622283
Int. Cl.[2] G01B 11/27; G02B 27/38
U.S. Cl. 356—400 4 Claims



1. Method of localizing a chip of rigid material and small dimensions with reference to a carrier plate, preparatory to fixing said chip to said carrier plate, comprising the steps of:

providing a pair of reference marks each in the form of an optical grating on a face of the chip to be localized that is parallel to the carrying surface of the carrier plate, the gratings of the respective reference marks being parallel to each other and the reference marks being respectfully located in regions spaced apart from each other and unsymmetrically disposed with respect to the center of said chip;

directing a laser beam alternately to the respective desired locations of said reference marks;

detecting light produced by said laser beam and reflected from said chip to be localized alternately in at least two light detectors so positioned and oriented as to receive light beams respectively corresponding to one of the secondary maxima produced by the incidence of the laser beam on each of said optical gratings when the respective reference mark is in the desired position, and

providing a signal when said light beam is received in each said detector and determining with reference to said signals when both of said reference marks are in the corresponding desired position.

4,153,368
ELECTRO-OPTICAL DETECTOR PROTECTION DEVICE

Gerald Falbel, Stamford, and Peter E. Spangenberg, Monroe, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 12, 1977, Ser. No. 859,354
Int. Cl.[2] G01J 1/42
U.S. Cl. 356—225 12 Claims

1. An improved system for making far field diagnostic measurements of an incident laser beam comprising:

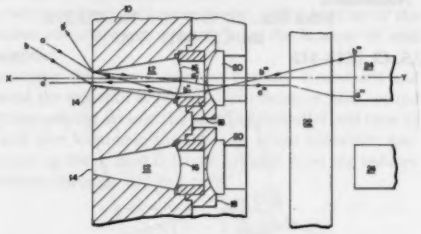
a plurality of electro-optical detectors arranged in a suitable array;

a plurality of electro-optical detector protection means, one protection means being associated with each detector:

each protection means comprising means capable of optically transmitting and refracting said laser beam, said last mentioned means having means for reflecting most of the energy of said laser beam away from its associated detector and allowing a reduced energy level laser beam to be directed at its associated detector;

means for focusing said reduced energy level laser beam on to its associated detector; and

means disposed between said focusing means and the associated detector for further attenuating said reduced energy



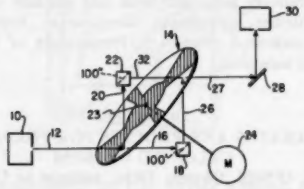
level laser beam before it impinges upon the associated detector.

4,153,369

CONVERTIBLE DUAL BEAM DIFFERENTIAL SPECTROFLUOROMETER AND ABSORPTION METER

Eli A. Kallet, New York, and Samuel Cravitt, Hartsdale, both of N.Y., assignors to Farrand Optical Co., Inc., Valhalla, N.Y.

Filed Nov. 11, 1977, Ser. No. 850,569
Int. Cl.[2] G01J *3/30, 1/10*
U.S. Cl. 356—318 5 Claims



1. Differential photometric apparatus comprising:

a light source positioned on one side of a rotatable mask to illuminate a portion of said mask, said rotatable mask having at least one transparent portion and at least one reflecting portion; a first container cell positioned on said one side of said mask to receive light from said light source reflected from a reflecting portion of said mask, and to emit light perpendicularly from said incident light toward a transparent portion of said mask; a second container cell positioned on another side of said mask to receive light from said light source through a transparent portion of said mask and to emit light perpendicularly from said light so incident toward a reflecting portion of said mask on said other side of said mask; a mirror positioned on said other side of said mask to receive light transmitted from said first container cell through a transparent portion of said mask, and light transmitted from said second container cell to a reflecting portion on the other side of said mask and said mirror redirecting said transmitted and reflected light toward a light detector; and means for rotating said mask; and

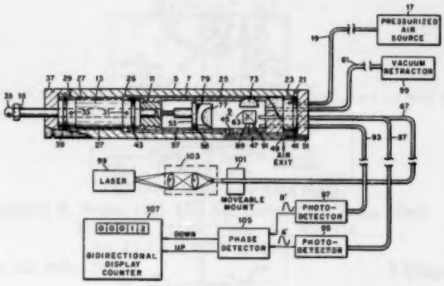
further comprising a selectively insertable first reflector adapted to be inserted in said first container cell for reflecting light incident from said light source on said first cell toward said one side of said mask; and a second selectively insertable second reflector adapted to be inserted in said second container cell for reflecting light from said light source incident on said second cell toward the other side of the mask.

4,153,370

MICROINTERFEROMETER TRANSDUCER

Harry S. Corey, III, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 5, 1977, Ser. No. 857,650
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—358 4 Claims



1. A microinterferometer displacement transducer, comprising:

a longitudinally extending housing an opening extending therein toward a back portion of said housing;

a cylindrical gas bearing disposed in said opening and forming a chamber in said housing between said bearing and said back portion of sais housing;

1 a longitudinally extending gauge probe disposed for longitudinal displacement coaxially in said bearing and extending without said housing to contact a surface to be engaged;

means for supplying a pressurized gas to said air-bearing;

a microinterferometer disposed within said chamber of said housing including a beam-divider cube, a fixed-cube-corner reflector and a movable cube-corner reflector mounted to move with said gauge probe, said fixed-cube-corner reflector and said movable cube-corner reflector mounted so that a laser beam directed into said beam-divider cube at a first point is divided to direct a first portion of said beam to said fixed-cube-corner reflector, the reflected first and second beam portions are directed to interferingly intersect at a second point in said beam-divider cube to form interference fringe patterns as said movable cube-corner reflector is moved by said probe in a gauging operation and divide said fringe patterns into first and second fields of view;

a remote single frequency laser beam source;

a self-focusing fiber-optic cable disposed for coherently transmitting said laser beam from said remote laser beam source into said housing and terminally mounted within said housing to provide said laser beam directed into said beam-divider cube at said first point;

first and second fiber-optic output cables mounted in said first and second fields of view of said fringe patterns, respectively, for transmitting said fringe patterns from said housing;

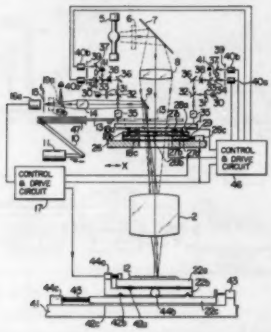
a quarter-wave plate mounted in the second field of view of said fringe patterns between said beam-divider cube and said second output cable is phase shifted one-quarter wave length from the pattern transmitted by said first output cable and;

means responsive to the fringe patterns transmitted by said first and second output cables for determining the magnitude and direction of displacement of said probe.

4,153,371
METHOD AND APPARATUS FOR REDUCTION-PROJECTION TYPE MASK ALIGNMENT

Mituyoshi Koizumi; Nobuyuki Akiyama, both of Yokohama, and Asahiro Kuni, Nakamachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 23, 1977, Ser. No. 771,201
Claims priority, application Japan, Feb. 25, 1976, 51/19004
Int. Cl.[2] G01B *11/27;* H05K *13/00*
U.S. Cl. 356—400 9 Claims



1. A mask alignment apparatus of reduction-projection type, comprising:

a mask table carrying a mask having an alignment pattern and a circuit pattern formed thereon, said mask table being finely rotatable and movable in two directions along X and Y orthogonal axes;

a wafer table for carrying a wafer, having an alignment pattern thereon, disposed at a distance from said mask, said wafer table being finely rotatable and movable in step and repeat movement at a predetermined pitch in two directions of the X and Y axes;

a reduction-projection lens interposed between said mask and said wafer so that an image of said circuit pattern is projected onto the chips of said wafer through said lens;

means for illuminating said alignment patterns of said mask and said wafer by a light having the same wavelength as an exposure light;

displacement detecting means for detecting the relative displacement between both images of said alignment patterns inversely projected through said lens;

first alignment means for moving said wafer table in a selected one of the directions of said X and Y axes by a distance between at least two remote chips and rotating said wafer table in accordance with at least two relative displacements obtained from said displacement detecting means thereby to cause the direction of step and repeat movement of said wafer table along the selected one of said X and Y axes to coincide with the direction of arrangement of said chips of said wafer;

second alignment means for moving said mask table at least in the two directions of said X and Y axes in accordance with the relative displacement between said predetermined alignment patterns obtained from said displacement detecting means thereby to align said mask and said wafer with each other;

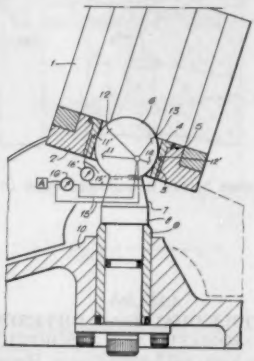
at least microscope means for detecting the relative displacement between reference patterns disposed at a predetermined position and respective mask alignment patterns formed at least on both side portions of said mask; and

means for rotating said mask table so as to eliminate the difference between both said relative displacements thereby to align said mask in the directions of said X and Y axes.

4,153,372
MIXER

Constant J. Nauta, 1 Midden Duin en Daalseweg, Overveen, Netherlands

Filed Mar. 21, 1977, Ser. No. 773,575
Int. Cl.[2] B01F *7/00*
U.S. Cl. 366—142 10 Claims

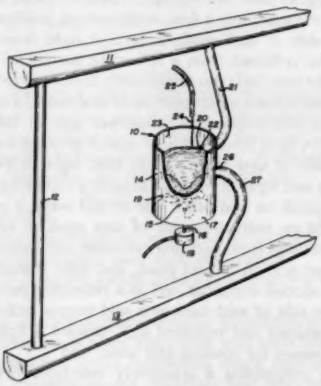


1. A material mixer comprising a vessel, mixing screw means in said vessel, said screw means being driven in an orbital path about its own axis and about the inner wall of said vessel; means journalling said screw means in said vessel, comprising a pin ball fixed to said vessel and complementary means on said shaft, operatively associated with said pin ball; said pin ball journal further comprising temperature feeling means, whereby undesired changes in temperature of the pin ball journal are measured.

4,153,373
APPARATUS AND PROCESS FOR PREPARING CALCINED GYPSUM

Eugene E. O'Neill, Okeene, Okla., assignor to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 777,213, Mar. 14, 1977. This application Apr. 19, 1977, Ser. No. 788,953
Int. Cl.[2] B01F *15/02*
U.S. Cl. 366—165 10 Claims



1. A process for preparing calcined gypsum characterized by having a lower water demand which comprises:

(1) feeding calcined gypsum to a blender, with the gypsum entering the blender container near the top thereof;

(2) adding water to the calcined gypsum immediately after it enters the blender container, said water being incorpo-

rated into the calcined gypsum in the form of a free-falling, continuous stream of water which does not directly contact the sidewall of the container or a propeller located in the bottom of said container;

(3) rotating said propeller positioned in the bottom of the blender container and spaced from the bottom of said container;

(4) sweeping the wetted calcined gypsum downward and around the sidewall of the blender container, said wetted gypsum passing around the rotating propeller and then to an exit port located in the sidewall of the container; and

(5) removing the wetted calcined gypsum from the blender container through said exit port.

4,153,374

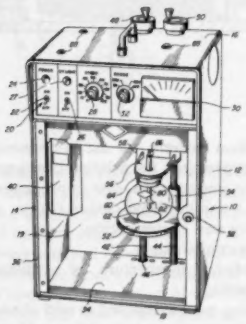
HOMOGENIZER APPARATUS

Robert P. Adams, Walden, N.Y., assignor to The Virtis Company, Inc., Gardiner, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,253

Int. Cl.[2] B01F *11/00, 7/00*

U.S. Cl. 366—208 **2 Claims**



1. In a homogenizer of the type having a motor, a spindle operably connected to and rotated by the motor, a flask for holding material to be homogenized, a lower flask base support and an upper flask clamp each adapted to retain the flask therebetween, a rotor mounted on a rotor shaft attached to the motor spindle, and positioned such that the rotor is within the flask; an improvement comprising:

frame means mounting the motor and spindle in a fixed positional relationship;

at least two shafts mounted at one end directly to the frame means and extending downwardly essentially parallel to the motor spindle, the lower flask base support and upper flask clamp being slideably mounted on said shafts;

clamping means for locking the lower flask base support and the upper flask clamp at any respective desired location along said shafts.

4,153,375

METHOD OF AGITATING SLURRIES

Geoffrey Hillyar-Russ, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

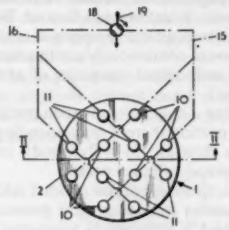
Filed Apr. 13, 1977, Ser. No. 787,364

Claims priority, application United Kingdom, Apr. 30, 1976, 17684/76

Int. Cl.[2] B01F *13/00*

U.S. Cl. 366—275 **19 Claims**

1. A method of agitating a slurry to increase its settling rate comprising repeatedly inflating and deflating at least one portion of a fluid inflatable means which is immersed in a liquid slurry, for gently agitating the liquid slurry and increasing settling rate of particulate material from the slurry and controlling fluid feed to said at least one portion during inflation



thereof and subsequently interrupting the fluid feed to said at least one portion during deflation thereof.

4,153,376

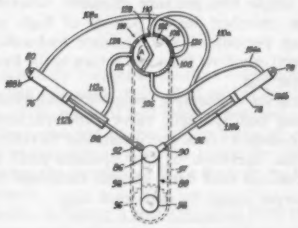
FEED MIXER APPARATUS

Benjamin R. Neier, 1211 13th St., Dodge City, Kans. 67801

Filed Sep. 21, 1977, Ser. No. 835,316

Int. Cl.[2] A23N *17/00*; B01F *7/08*

U.S. Cl. 366—298 **8 Claims**



1. In a feed mixer apparatus having hopper means for containing feed materials to be mixed, a plurality of mixing conveyor means disposed in said hopper means for churning the feed materials, and conveyor drive means operatively connected to at least one said conveyor means for driving said plurality of conveyor means, the improvement of hydraulic means for driving said conveyor means, said hydraulic drive means comprising:

a hydraulic drive output shaft operatively connected to the conveyor means to provide rotational motion thereto;

a cylinder support frame borne by the hopper;

a pair of hydraulic cylinders each having a proximal extension compartment and a distal retraction compartment, each of which is pivotably secured at the proximal end thereof to said cylinder support frame, and each of which has a cylinder rod operatively projecting from the distal end of each said cylinder;

a common crank arm secured to one of the mixing conveyor means for rotationally driving the mixing conveyor means;

rod securement means for pivotably attaching each of said cylinder rods at the distal end thereof to said common crank arm for rotationally driving said common crank arm, thereby to drive the mixing conveyor means for churning the feed material within the hopper;

hydraulic motor means operatively connected to said extension and retraction chambers of said hydraulic cylinders for driving said cylinders, said hydraulic motor means having a hydraulic valve assembly, said hydraulic valve assembly including:

a cylindrical valve body having fluid input and output openings disposed at opposite ends thereof, and paired ports for each hydraulic cylinder disposed in radial

opposition in a single transverse plane at a central portion of said valve body; and

a valve rotor disposed within said valve body, said rotor having therein annularly continuous fluid input and output grooves disposed at opposite ends thereof, said annular grooves continuously communicating with the fluid input and output openings of said valve body respectively,

said rotor having a cylinder activation portion disposed at the central portion thereof corresponding to the transverse plane through the valve body containing said radially disposed cylinder ports,

said cylinder activation portion divided into a single high pressure chamber and a single low pressure chamber by a barrier which is v-shaped in transverse cross section, said v-shaped barrier extending radially through an angle of greater than 90° but less than 180°, whereby during rotation of said valve rotor said v-shaped barrier opens a first port to communication with said high pressure chamber and simultaneously the remaining three ports to communication with said low pressure chamber,

said valve rotor having a longitudinally extending input communication bore connecting said annular input groove and said single high pressure chamber, and having a longitudinally extending output communication bore connecting said annular output groove and said single low pressure chamber, whereby within a given chamber during periods of high pressure and during periods of low pressure hydraulic fluid may respectively flow from and return to the hydraulic fluid source; and

synchronous connecting means for interconnecting and driving said hydraulic valve rotor synchronously with said common crank arm means and thereby synchronizing the operation of said cylinder rods to effect by mechanical feed back smooth rotational drive of the conveyor means by said crank arm.

4,153,377

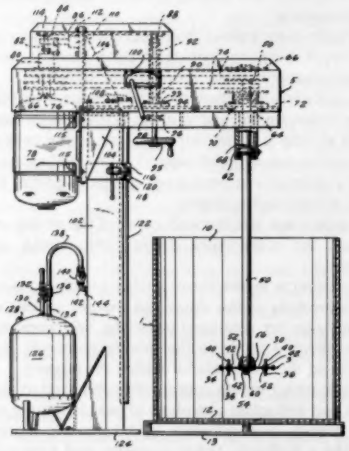
APPARATUS FOR AND METHOD OF DISSOLVING A SOLID IN A LIQUID

Lars J. Been, Jr., 11 Summit St., Glen Ridge, N.J. 07028

Filed Oct. 25, 1977, Ser. No. 844,521

Int. Cl.² B01F *7/16*

U.S. Cl. 366—317 **12 Claims**



6. A dissolver comprising a cylindrical tank, a separator having a circumference of rotation within the range of 15% to 35% of the diameter of the tank, means for mounting said separator for rotation around an axis and for movement up and down along said axis in said tank, said separator having a plurality of rods mounted thereon substantially in a single plane and equidistant from said axis about 50% to 75% of the distance from the axis to the circumference of rotation thereof and extending upwardly and downwardly therefrom a distance within the range of 50% to 100% of the radial distance of said rods from the center of said disk.

4,153,378

RE-INKING AND VENTILATION CONTROL FOR INKED RIBBON CASSETTE

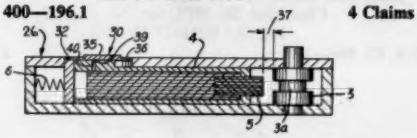
Herbert Scherrer, Pfaffikon; Ernst Bopp, and Ennio Cecchetto, both of Zürich, all of Switzerland, assignors to Franz Buttner AG., Zürich, Switzerland

Continuation-in-part of Ser. No. 672,127, Mar. 31, 1976, Pat. No. 4,071,133. This application Mar. 7, 1977, Ser. No. 774,894

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551677

Int. Cl.² B41J *33/14*

U.S. Cl. 400—196.1 **4 Claims**



1. An ink ribbon cassette, for use in connection with a device, such as a typewriter, for printing characters on a surface from the stroke impact of a dye impregnated ribbon, said ribbon having a compressible center region, and two outer regions bounding said center region,

comprising in combination:

a housing defining an aperture for ventilating a chamber defined therein;

re-impregnating means disposed in said chamber and operable for re-impregnating said ribbon with dye, when in an operating position;

locking means mounted on, and movable with said re-impregnating means, and also removably engageable with an edge of said aperture and operable to lock said re-impregnating means in a deactivated position against the bias of a spring during engagement of said locking means with said aperture; and

dye transfer means cooperating with said re-impregnating means when said re-impregnating means is in the operating position for transferring dye to said ribbon, said dye transfer means comprising a pair of outer transfer portions and an intermediate recessed portion, said outer transfer portions contacting said re-impregnating means in the operating position thereof for transferring dye to the outer regions of said ribbon by said outer transfer portions, the compressible center region of said ribbon remaining free of any contact with the intermediate recessed portion of said dye transfer means, whereby said compressible center region of said ribbon receives the dye by capillary action from the outer regions of said ribbon.

4,153,379

KNOCK-OUT TYPE AUTOMATIC PENCIL

Wen-Kuei Chao, No. 47, Chung Cheng Rd., Ying Ko, Taipei Hsien, Taiwan

Filed Jan. 25, 1977, Ser. No. 762,784

Int. Cl.² B43K *21/16*

U.S. Cl. 401—50 **17 Claims**

1. Knock-out type automatic pencil comprising:

(a) an outer barrel to facilitate holding by the user,

(b) a stopper collar being connected to the front end of said barrel, the front end of the collar being provided with at

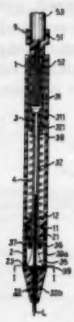
least two radially and oppositely projected pinching members, space being provided inside the collar to retain a clamp means and a control ring;

(c) an inner tube assembly coaxially and movably retained inside the outer barrel and including:

a rear tube section of enlarged diameter to retain a push-button means,

a lead tube for passing a single piece of pencil lead, with its rear end connected to said rear tube section, the front end of said lead tube being formed successively and integrally from rear to front, a conical clamp means for holding of the lead tube and being retained inside said stopper collar;

an inverted concial shaped head portion connected to said



clamp means and being projected outside the front end of said collar; said control ring enclosing said clamp means and operative to open and close said clamp means by way of a tapered hole through said ring;

(d) a spiral spring retained inside said outer barrel by means located between the front end of said outer barrel and the front end of said rear tube section of said inner tube assembly, said spring and said retaining means operative for supporting said inner tube inside said outer barrel and forcing said clamp means to be tightened up with said control ring through wedge effect;

(e) a push-button means with its front end inserted into the rear end of said inner tube assembly and its rear end projecting outside the rear end of said outer barrel.

4,153,380

SOIL PENETRATION EMITTER FOR DRIP IRRIGATION SYSTEMS

Gary R. Hartman, 401 Valencia School Rd., Aptos, Calif. 95003

Filed Aug. 25, 1977, Ser. No. 827,715

Int. Cl.[2] E02B *13/00*

U.S. Cl. 405—39 **3 Claims**

1. A drip emitter for use in a drip irrigation system, comprising:

an elongated body having an upper portion of sleeve-like configuration, forming an internal chamber open at its upper end and provided with a bottom wall;

a lower body portion intergral with said bottom wall including a plurality of angularly spaced fins extending radially outwardly from the axis of the body and axially downwardly from said bottom wall and tapering from generally the width of the upper body portion down to a narrow point at the lower end, so that the device can be driven into the ground;

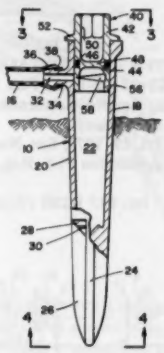
means forming an inlet for water from a supply source into said chamber of the upper portion intermediate the ends thereof;

outlet means formed in said chamber adjacent the uppermost ends of the fins for dispensing water from the chamber below the ground surface;

adjustable valve means connected to the upper body portion for controlling the quantity of water flow from the inlet into the chamber; and

a hollow cylindrical member rotatably mounted within the open end of the body concentric therewith and having a radially extending peripheral flange bearing against the upper end of said body;

said member having a closure wall extending transversely thereacross interiorly thereof and a skirt portion extending downwardly from said wall over the inlet and snugly fitting within said body;



a tapered, generally triangular aperture extending semi-circumferentially through the wall of said skirt portion substantially in the plane of said inlet means; and

means at the upper end of the hollow cylinder and above said wall engageable by a tool to rotate the valve means for adjusting the amount of flow through said inlet and said aperture;

said inlet means including a boss extending from the outside of the upper body portion, with a bore through the boss into said chamber, and an enlarged barb-shaped portion with a conical surface at the outer end of the boss for receiving and retaining a flexible water supply line.

4,153,381

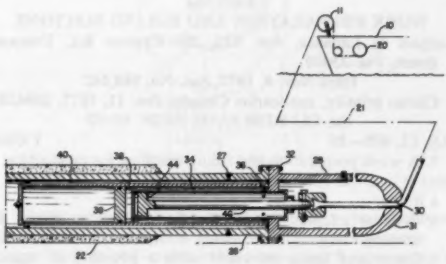
SHOCK ABSORBING APPARATUS FOR HOISTING UNDERWATER PIPELINE

Royal T. Hawley, Everett, Wash., assignor to Western Gear Corporation, Everett, Wash.

Filed Aug. 31, 1977, Ser. No. 830,778

Int. Cl.[2] F16L *1/04*

U.S. Cl. 405—173 **3 Claims**



1. A pipeline hoisting system for abandoning and recovering elongated pipelines connected by a cable to a vessel from the floor of a body of water having wave motion which causes load shocks, comprising:

coupling means adapted to be welded to the free end of the pipeline while on the vessel, and

shock absorption means secured to and within said coupling

means and adapted to be fastened to said cable whereby wave load shocks when lowering or raising the pipeline are absorbed by said shock absorption means at the pipeline, said shock absorption means including a prepressurized pneumatic-fluid accumulator, a piston and cylinder in communication with said accumulator for passing fluid to and from the accumulator in response to movement of said piston, said piston being adapted to be coupled to said cable for transferring motion of the vessel to movement of the piston and thereby absorb the load shocks on the pipeline.

4,153,382

CENTER DRILLING MACHINE

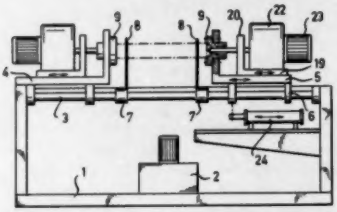
Helmut Mueller, Kirchheim-Teck, Fed. Rep. of Germany, assignor to Sprimag Spritzmaschinenbau GmbH, Kirchheim-Teck, Fed. Rep. of Germany

Filed Jul. 19, 1977, Ser. No. 817,099

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1976, 2632481

Int. Cl.[2] B23B *49/04*

U.S. Cl. 408—10 **6 Claims**



1. An apparatus for center drilling of rod-like materials comprising:

a frame supporting a first centering cone mounted stationary to said frame, a second centering cone movably mounted to said frame for movement along an axis extending between said first and second centering cones, an adjustable and movable workpiece rest mounted to said frame for supporting a rod-like member along said axis, first and second center drilling means each movably mounted to said frame and each adjacent to and cooperating with one of said centering cones for center drilling of the ends of a rod-like member, adjustable sensing means for controlling the extent of center drilling at each end of the rod-like member and means for movement of said movable centering cone along said axis.

4,153,383

WORK PREPARATION AND RULING MACHINE

Jacques de Lanauze, Apt. 532, 259 Cypress Rd., Pompano Beach, Fla. 33060

Filed Nov. 4, 1977, Ser. No. 848,642

Claims priority, application Canada, Jan. 11, 1977, 269433

Int. Cl.[2] B23B *41/00, 39/06, 49/00*

U.S. Cl. 408—26 **1 Claim**

1. A work preparation and ruling machine for production of semi-cylindrical rotary dies, comprising:

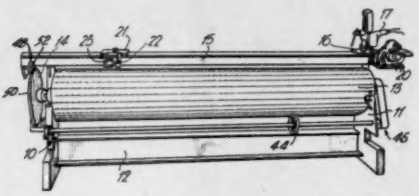
a frame;

a cylinder adapted to detachably receive the rotary die thereon, said cylinder being rotatably mounted in the frame and being provided with a plurality of equally spaced longitudinal rows of holes, the holes being radially formed in the surface of the cylinder relative to the central longitudinal axis thereof thereby forming a plurality of equally spaced radial rows of the spaced holes;

an end wheel coaxially secured to one end of the cylinder and provided with a first positioning means whereby the cylinder can be rotated by a distance equal to the distance between each two adjacent longitudinal rows of the spaced holes said end wheel having the same diameter as that of a finished die; said first positioning means including a second stopper mounted on the guide bar and a set of equally spaced recesses provided in a peripheral surface of the end wheel;

a guide bar mounted in the frame, said guide bar being spaced above the cylinder and parallel with the central longitudinal axis of the cylinder, said guide bar being equipped with a plurality of positioning recesses in a longitudinal surface thereof, said recesses being spaced from each other by the distance between each two adjacent radial rows of the spaced holes of the cylinder;

a first carriage slidably mounted on the guide bar, said first carriage being equipped with a first stopper means adapted to engage the positioning recesses of the guide bar and including a drilling means perpendicularly movable to the surface of the cylinder between an inoperative position and an operative position, said drilling means being



mounted on the first carriage in such a manner that the bit of the drilling means is perpendicular to the surface of the cylinder and is aligned with the corresponding hole when both the wheel and the first carriage are positioned; said guide bar being provided with a first digital distance measuring device which is actuated by the end wheel; said first carriage being equipped with a die cutting means which is rotatable between parallel and perpendicular cutting positions to the guide bar and which is perpendicularly movable between an inoperative position and an operative position;

a second carriage slidably mounted on said guide bar, said second carriage being equipped with a tracing means adapted to rule the surface of the rotary die board on the cylinder and including a second digital distance device which is actuated by the guide bar; and a second wheel mounted on a shaft parallel to said cylinder and interconnected thereto for rotating the same.

4,153,384

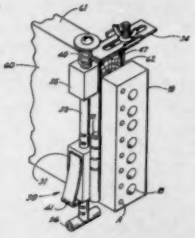
DOWEL HOLE BORING GUIDE

Ike Isaken, 1727 Labrador Dr., Costa Mesa, Calif. 92626

Filed Dec. 5, 1977, Ser. No. 857,673

Int. Cl.[2] B23B *47/28, 39/00*; B27C *3/00*

U.S. Cl. 408—115 R **10 Claims**



1. A dowel hole boring guide comprising:

a tool support having at least one tool opening passing therethrough;

a clamp adapted for clamping across the width of a work piece which is to receive a dowel hole, said clamp incorporating at least two parallel clamping surfaces adapted for contacting opposed edges of said work piece; and,

a hinge interposed between and connecting said tool support and said clamp, said hinge having a rotational axis perpendicular to said clamping surfaces.

4,153,385

SELF-DRAWING CENTRIFUGAL PUMP

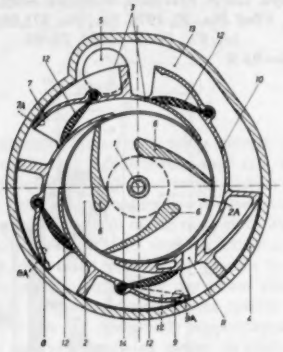
Johann Riefenthaler, Korneuburg, Austria, assignor to Spezialfabrik moderner Pumpen Ernst Vogel, Stockerau, Austria

Filed May 9, 1977, Ser. No. 795,361

Claims priority, application Austria, May 12, 1976, 3453/76

Int. Cl.[2] F01D *1/12*

U.S. Cl. 415—53 R **3 Claims**



1. In a self-drawing centrifugal pump having an inlet port and an outlet port, comprising a housing having a distributor member defining a pumping chamber separated from an air separating outlet chamber, a rotatable impeller supported in said pumping chamber, said distributor member including a plurality of circumferentially spaced blades and radial passageways therethrough circumferentially spaced around said pumping chamber to provide communication between said pumping chamber and said outlet chamber, said distributor member having a recirculation port near the bottom of said pumping chamber, said recirculation port providing direct communication between said chambers, the improvement comprising wherein said blades and said radial passageways are asymmetrically spaced around said pumping chamber and wherein a movably supported flap is provided in each of said radial passageways movable between opened and blocked positions across said radial passageways, said flaps each being resiliently biased to initially block said radial passageways and being openable in response to a small pressure differential thereacross to facilitate a flow of fluid media only from said pumping chamber to said outlet chamber.

4,153,386

AIR COOLED TURBINE VANES

John A. Leogrande, West Hartford, and Richard Levine, Bloomfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 11, 1974, Ser. No. 531,632

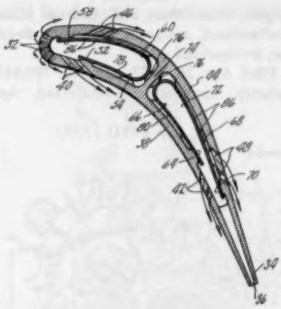
Int. Cl.[2] F01D *5/18*

U.S. Cl. 415—115 **7 Claims**

1. In a cooled turbine vane having a hollow airfoil section including a leading edge having a plurality of leading edge cooling holes in gas communication with the hollow portion thereof, a pressure side, and a suction side having a plurality of suction side holes in gas communication with the hollow portion thereof, the improvement comprising:

a substantially U-shaped insert having a pressure side leg and a suction side leg, the insert being disposed within the hollow portion of the airfoil section; and

means located within the hollow portion of the airfoil section, including a first sealing rib on the suction side of the airfoil section between the suction side holes and the



leading edge cooling holes and a second sealing rib on the pressure side of the airfoil section adjacent to the leading edge holes, for isolating cooling flow to the leading edge holes from flow to the suction side holes, the suction and pressure legs of the insert being adapted to seal against the first sealing rib and second sealing rib respectively in operative response to the internal pressure within the hollow portion of the airfoil section.

4,153,387

COVER ARRANGEMENT FOR RADIAL ROTORS OF TURBO MACHINES SUCH AS GAS TURBINE ENGINES

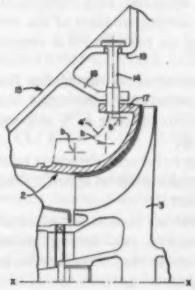
Wolfgang Weiler, Dachau, Fed. Rep. of Germany, assignor to MTU Munchen GmbH, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,679

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 2607776

Int. Cl.[2] F01D *1/00*

U.S. Cl. 415—219 C **23 Claims**



1. Cover arrangement for radial rotors of turbo machines, such as gas turbine engines, said arrangement comprising:

cover parts joined together by connecting flanges along a dividing plane extending through a central axis, said central axis being aligned with a rotational axis of a radial rotor when said cover parts are in a position covering the radial rotor;

and supporting rib means carried by said cover parts, said supporting rib means being spaced around a perimeter of the cover parts;

wherein the area moments of inertia of the supporting rib

means are matched to the area moments of inertia of the connecting flanges to assist in insuring a constant radial gap between the radial rotor and the cover parts during operating conditions.

4,153,388

METHOD AND APPARATUS FOR MONITORING THE STATE OF OSCILLATION OF THE BLADES OF A ROTOR

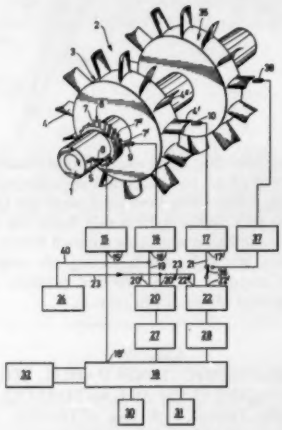
John P. Naegeli, Winterthur, and Andreas Maurer, Seuzach, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 26, 1977, Ser. No. 790,945

Claims priority, application Switzerland, Apr. 30, 1976, 5425/76

Int. Cl.[2] F01D *21/00*

U.S. Cl. 416—61 **6 Claims**



3. An apparatus for monitoring the state of oscillation of the blades of a rotor of an axial turbomachine without physical contact, said apparatus comprising

a circumferentical array of reference control lugs for mounting on the rotor;

a first pick-up adjacent said control lugs for generating timing pulses during rotation of the rotor, each said pulse corresponding to passage of a respective lug past said pick-up;

a second pick-up adjacent the blades for generating timing pulses during rotation of the rotor, each said latter pulse corresponding to passage of a respective blade past said second pick-up;

a pulse generator externally disposed relative to the rotor for generating a pulse train of specific frequency during rotation of the rotor;

a first switch having a first input connected to said first pick-up to receive said timing pulses therefrom and a second input connected to said pulse generator to receive said pulse train;

a second switch having a first input connected to said secod pick-up to receive said timing pulses therefrom and a second input connected to said pulse generator to receive said pulse train;

a first counter connected to said first switch for counting the number of pulses of said pulse train passed by said first switch during the time interval between each two consecutive timing pulses from said first pick-up to obtain reference pulse numbers for each revolution of the rotor;

a second counter connected to said second switch for counting the number of pulses of said pulse train passed by said second switch during the time interval between two consecutive timing pulses from said second pick-up to obtain blade-pair pulse numbers for each revolution of the rotor; and

an evaluating unit connected to each said counter to receive said pulse numbers for each revolution of the rotor and to (a) calculate the quotient of said pulse numbers for each blade pair for each revolution of the rotor; (b) determine the maximum and minimum values of the quotients during continued rotation of the rotor; (c) calculate the difference between the maximum and minimum values of the quotients; (d) compare the difference with a preset critical value; and (e) generate an activity signal in response to said difference exceeding said critical value.

4,153,389

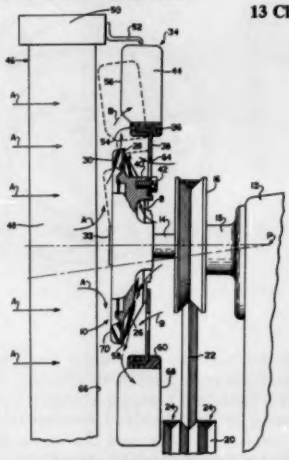
FAN-FAN DRIVE ASSEMBLY

Keith A. Boyd, 220 N. Marshall, Marshall, Mich. 49068

Filed Jan. 20, 1978, Ser. No. 871,054

Int. Cl.[2] F04D *29/32, 29/64*

U.S. Cl. 416—93 R **13 Claims**



1. A fan-fan drive assembly for cooling the prime mover of a vehicle comprising:

(a) a fan rotatable about an axis and made of plastic, said fan including

1. an axially extending annular hub portion having an inner circumferential surface, a front edge lying in a generally radially extending plane, and a rear edge, and

2. a plurality of radially extending fan blades secured to said hub and each having a front edge lying in a generally radially extending plane and a rear edge;

(b) fan drive means to rotate said fan about said axis, said fan drive means including

1. a front face,

2. a rear face axially spaced from said front face and having a plurality of radially extending cooling fins each terminating at a forwardly located radially outermost portion that lies in a generally radially extending plane, and

3. an outer circumferential surface configured to be fit within and radially spaced from said inner circumferential surface of said fan to define an annular passage between said inner and outer circumferential surfaces; and

(c) means securing said fan in axially fixed encircling relationship to said fan drive to locate said plane of said outermost portion of said rear fins forwardly of said plane of said front edge of said hub and to define said annular passage.

4,153,390

HELICOPTER ROTOR STRUCTURE

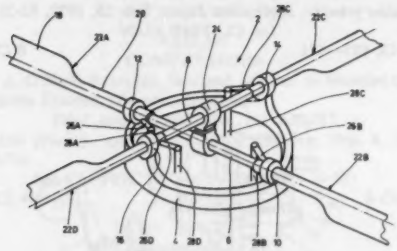
Emil Weiland, Hohenbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 12, 1977, Ser. No. 824,093

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638167

Int. Cl.[2] **B64C** *27/38*

U.S. Cl. 416—138 **6 Claims**



1. A rotor structure for a rotary wing aircraft, comprising rotor head means having a central rotational axis, rotor blade or wing means including blade root means and arranged in at least two pairs, bending resistant tension bar means operatively interconnecting said blade root means of a pair of wings so that bending moments caused by the lead-lag movements of said wing means are transmitted from said root means to the respective tension bar means, said tension bar means crossing each other to form a crossing, bearing means spaced from said central rotational axis and operatively supporting said tension bar means and said blade or wing means on said rotor head means, said bearing means permitting longitudinal movements of said tension bar means relative to said rotor head in the axial direction of said tension bar means as well as deflections of said tension bar means substantially at said crossing under the influence of said bending moments in the lead-lag direction, said rotor structure further comprising centering means operatively interconnecting said tension bar means substantially at said crossing to substantially prevent longitudinal movement of said tension bar means relative to said centering means, said centering means being arranged for displacement relative to said rotor head in the plane of rotation of the rotor in response to said deflections of said tension bar means, whereby mass unbalances caused by the lagging movement of the blade or wing means are at least partially balanced.

4,153,391

TRIPLE DISCHARGE PUMP

Ezra D. Hartley, Los Angeles, Calif., assignor to Carr-Griff, Inc., Anaheim, Calif.

Continuation of Ser. No. 581,711, May 29, 1975, abandoned. This application Aug. 31, 1977, Ser. No. 829,222

Int. Cl.[2] **F04B** *1/12, 1/18*

U.S. Cl. 417—269 **17 Claims**

1. A pump adapted to be driven by a motor having a rotatable shaft comprising:

a housing having a cavity therein;

a flexible diaphragm extending across said cavity to divide the cavity into a pumping compartment on one side of the diaphragm and an equipment compartment on the other side of the diaphragm;

retaining means for retaining said diaphragm in said housing;

first means cooperable with a first region of said diaphragm to define a first pumping chamber;

said pumping chamber being in said pumping compartment;

means defining an inlet for said first pumping chamber;

means defining an outlet for said first pumping chamber;

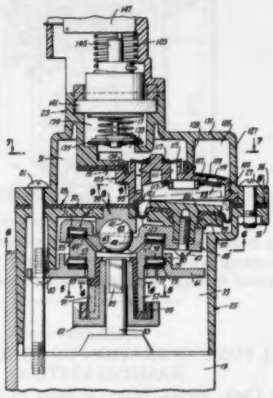
a bearing support mounted on the housing in the equipment compartment;

a wobble plate;

bearing means axially intermediate said bearing support and said wobble plate for permitting said wobble plate to wobble and for transmitting radial loads from said wobble plate to the bearing support;

rotatable drive means in the equipment compartment for driving said wobble plate;

coupling means for drivingly coupling the drive means to



the shaft of the motor whereby the wobble plate can be driven without substantially radially loading the motor shaft;

means for attaching the wobble plate to the diaphragm to substantially prevent rotation of the wobble plate, said first region of the diaphragm being movable by the wobble plate to provide a pumping action; and

said coupling means including a bushing adapted to drivingly receive the shaft of the motor and resilient means for drivingly coupling the bushing and the drive means so that the shaft can rotate the drive means.

4,153,392

REFRIGERATION COMPRESSOR LUBRICATION

John P. Elson, Sidney, and Ernest R. Bergman, Rossburg, both of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Apr. 14, 1977, Ser. No. 787,380

Int. Cl.[2] **F04B** *17/00, 35/00*

U.S. Cl. 417—372 **13 Claims**

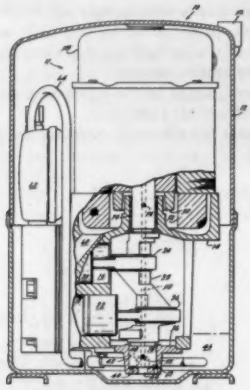
1. A lubrication system for a refrigeration compressor having a housing, compressor means disposed within said housing, a vertical crankshaft provided in said housing and drivingly connected to said compressor means, one end of said crankshaft being journaled in a lower bearing housing associated with said housing, said lower bearing housing having bearing surfaces engaging said crankshaft, said lubrication system comprising:

an oil sump containing lubricant having entrained foreign particles;

lubricant pumping means provided in said crankshaft for supplying lubricant from said sump to said bearing surfaces and said compressor means, said lubricant pumping means being operative to separate said entrained foreign particles from said lubricant flowing to said bearing surfaces and said compressor means;

collecting means provided in said lower bearing housing for receiving said separated foreign particles from said pumping means, said collecting means including an annular

groove, and said pumping means being operative to flush said particles into said groove, and



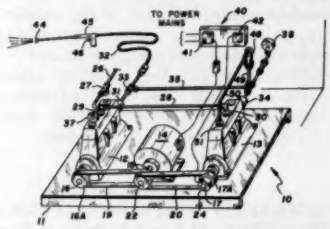
passage means provided in said lower bearing housing communicating with said collecting means for returning said separated foreign particles to said oil sump.

4,153,393

DUAL PUMP OPERATION OF COIN-OPERATED WASHING SYSTEM

James E. Cook, Anoka, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Apr. 15, 1977, Ser. No. 787,746
Int. Cl.[2] F04B *23/04*
U.S. Cl. 417—429 **5 Claims**



1. In a high pressure liquid pumping system having means for selecting multiple output pressures and capacities and comprising:

(a) motor means having an output shaft delivering energy at a certain predetermined rotational rate;

(b) first and second fluid pumps, each having an input drive shaft and with the fluid inlet of each being coupled to a common source of liquid, conduit means coupling the inlet of said first fluid pump to the inlet of said second fluid pump, and with the outlet of each fluid pump being coupled together to a common discharge line, and with said discharge line having means for providing an intermittent output from said pumping system;

(c) first and second drive means coupling said motor means to said input drive shafts of said first and second fluid pumps respectively, with said first drive means being normally drivably coupled to said drive shaft of said first fluid pump, and with said second drive means being normally disengaged from driving said drive shaft of said second fluid pump and having an electrical selector switch means for selectively and electromechanically coupling said second drive means to said drive shaft of said second fluid pump, and

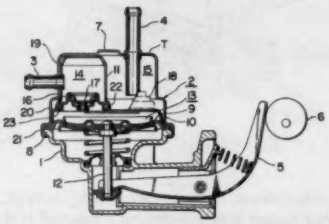
(d) bypass means including a bypass conduit having an automatic, pressure-operated unloader valve interposed therealong coupling the output of said second fluid pump to the inlet thereof, with the fluid flow through said bypass conduit being controlled by said automatic, pressure-operated unloader valve.

4,153,394

FUEL PUMP

Takashi Nakada, Sowa, Japan, assignor to Kyosan Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1977, Ser. No. 832,964
Claims priority, application Japan, Feb. 28, 1977, 52-21124
Int. Cl.[2] F04B *45/04*
U.S. Cl. 417—571 **8 Claims**



1. In a diaphragm-type fuel pump, including a thick-walled body having an opening therein, a pumping diaphragm extending across and closing said opening, a cup-shaped outer casing positioned over said diaphragm and connected to said body, said outer casing being formed from a thin metal sheet and having an end wall spaced a substantially distance from said diaphragm, said outer casing having three axially-spaced sections with a first said section being disposed directly adjacent said end wall and a second said section being cylindrical and disposed axially between said first section and the third said section, said third section being cylindrical and defined at the mouth of said outer casing and connected to said body, said third section having a diameter greater than said second section, said second section having a cross-sectional area greater than said first section, a separator positioned within and extending diametrically across said outer casing, said separator being positioned axially between said end wall and said diaphragm and being spaced from said diaphragm to define a pumping chamber therebetween, said separator and said diaphragm having the peripheral edges thereof fixedly interposed between said body and said outer casing within said third cylindrical section, said separator having cylindrically projecting inlet and outlet valve holding sections formed therein and projecting axially of said separator toward said end wall, inlet and outlet valve means respectively mounted within said inlet and outlet valve holding sections, means disposed within the compartment defined within said outer casing between said end wall and said separator for dividing said compartment into inlet and outlet chambers which respectively communicate with the inlet and outlet valve means, an inlet pipe projecting through the outer casing for communication with the inlet chamber, and an outlet pipe connected to the outer casing for communication with the outlet chamber, comprising the improvement wherein the first section of said outer casing is cylindrical and has a diameter less than said second section, all of said cylindrical casing sections being coaxially aligned, the dividing means being a substantially cylindrical cup-shaped shell formed from a thin metal sheet, said shell defining said inlet chamber in the interior thereof, said shell being closed at one end by a base wall which is disposed in engagement with the end wall of said outer casing, said shell at its open free and having an outwardly flared flange positioned in surrounding relationship to the inlet valve holding section on said separator, a seal positioned within said flared flange in surrounding and

sealing engagement with said inlet valve holding section, said flared flange on said shell being positioned within said second cylindrical section, said shell being positioned sidewardly within said outer casing so that the cylindrical sidewall of said shell is maintained in contact with the inside surface of the cylindrical sidewall defining said first cylindrical section, and said inlet pipe as disposed exteriorly of said outer casing extending transversely relative to the cylindrical sidewall defining said first cylindrical section, said inlet pipe projecting transversely through the cylindrical sidewalls of said shell and said first cylindrical section at their region of contact for direct communication with said inlet chamber.

4,153,395

COMPRESSORS

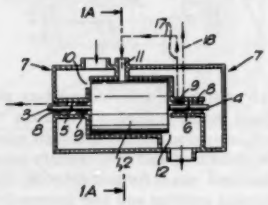
Peter A. O'Neill, Bearsden, Scotland, assignor to Howden Compressors Limited, Glasgow, Scotland

Filed Aug. 30, 1977, Ser. No. 830,017

Claims priority, application United Kingdom, Sep. 4, 1976, 36750/76

Int. Cl.[2] **F04C** *17/12, 23/00, 27/00, 29/00*

U.S. Cl. 418—9 **6 Claims**



1. An interacting-screw gas compressor comprising a casing having a pair of intersecting cylindrical portions forming a working space, gas inlet and outlet openings at the respective ends of the working space, and a pair of axially extending end bores disposed at the outlet end of the working space, a pair of male and female rotors housed in the respective cylindrical portions of the casing, said rotors having respectively lobes and grooves for interaction to form gas compression chambers and having a pair of end shafts extending into said pair of end bores, a pair of bearings disposed in the outer end portions of said end bores and supporting said pair of end shafts, an additional gas inlet opening formed in the cylindrical portion housing the female rotor to provide communication with a groove of the female rotor when said rotor is at or beyond rotor cut-off, and conduit means connecting inner end portions of said end bores to said additional gas inlet opening so that pressurized gas leaking from a compression chamber into said end bores flows from said end bores into a compression chamber.

4,153,396

ROTARY ENGINE OR PUMP

Edgar F. Landry, 88 Mildred Ave., Springfield, Mass. 01104

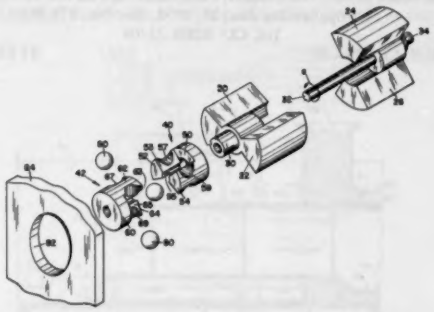
Filed Nov. 21, 1977, Ser. No. 853,094

Int. Cl.[2] **F01C** *1/00;* **F03C** *3/00;* **F04C** *1/00*

U.S. Cl. 418—38 **4 Claims**

1. A control system for controlling the rotative movements of a pair of coaxial shafts in a rotary internal combustion engine or pump including:

a pair of recessed controllers, each controller mounted on one of the coaxial shafts, two pairs of balls, each ball being receivable in one of the recesses defined by the confronting adjacent recesses of adjacent controllers, an eliptical cam having a closed eliptical surface, the controllers being extendable in a first plane through the cam with the balls being held captive between the controllers and closed elliptical surface of the cam lying in a second plane extending normal to the first plane for controlling the alternating shaft rotation whereby a first shaft rotates through a first arc of certain degrees while the second shaft rotates through a second arc of greater degrees than the first arc followed by the rotation of the second shaft through the



first arc of certain degrees while the first shaft rotates through the second arc of greater degrees than the first arc.

4,153,397

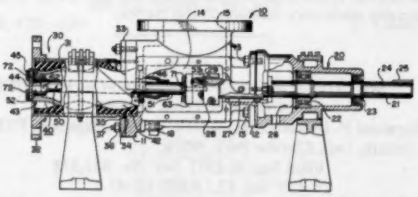
ROTOR DRIVE COUPLING FOR PROGRESSING CAVITY PUMP

Clifford H. Allen, 13109 Westchester Trail, Chesterland, Ohio 44026

Filed Sep. 16, 1977, Ser. No. 833,740

Int. Cl.[2] **F04C** *1/06;* **F01C** *1/08*

U.S. Cl. 418—48 **8 Claims**



3. In a flexible shaft assembly for connecting a rotary drive to a rotary load wherein said shaft flexes in response to beam-type bending moments that occur during shaft rotation, the improvement which comprises:

a radial hub on at least one end of said shaft for connecting said one end to one of said rotary drive and said rotary load and

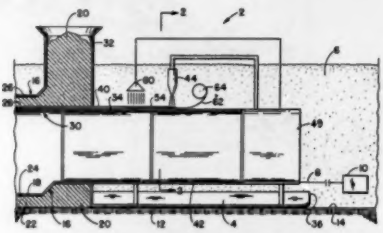
an annular stress relief member mounted on said shaft inwardly of and secured to said radial hub, said stress relief member having an axial extension tightly positioned around the underlying surface portion of said shaft to provide a fixed-end, cantilever support for said shaft, said axial extension being adapted to flex resiliently with said flexible shaft to reduce stress concentration and thereby reduce the maximum bending stress in said flexible shaft, whereby bending stresses occurring due to the bending moment produced by beam-type shaft flexure are transmitted to said stress relief member to reduce stress at the junction of said shaft and said radial flange.

4,153,398

APPARATUS FOR PRODUCING CAST-IN-PLACE PIPE EMPLOYING PERMANENT PIPE MOLD

George M. Keller, 900 Indian Way, Novato, Calif. 94947

Division of Ser. No. 648,241, Jan. 12, 1976, Pat. No. 4,075,300.
This application Jan. 23, 1978, Ser. No. 871,582
Int. Cl.[2] B28B *21/06*
U.S. Cl. 425—59 17 Claims



1. Apparatus for the formation of long lengths of continuous pipe in an open trench comprising a sled for movement through the trench; first means connected with the sled for forming a lower pipe half in the trench; second means connected with the sled for forming an upper pipe half homogeneously with the lower half; and intake means for feeding cementitious material to the first and second pipe-forming means while the sled moves through the treanch; the second means including a mandrel connected with the sled having an upwardly convex surface disposed forward of the intake means and having a shape closely approximating the shape of an interior surface of the upper pipe half; means for placing a relatively thin layer of a deformable and hardenable plastic material in its deformable state over the convex mandrel surface to conform the material to the mandrel, the placing means being positioned relative to the intake means so that the plastic material conforms to the mandrel while in its deformable state and has substantially hardened when contacted by the cementitious material; and means permitting the separation of the plastic layer from the mandrel surface so that the mandrel can be moved relative to the plastic layer while the plastic layer remains stationary relative to the trench.

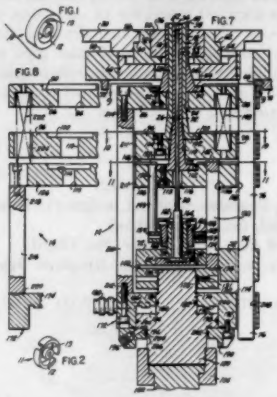
4,153,399

MULTIPLE PUNCH TOOL SET FOR POWDER COMPACTING PRESS

Raymond P. DeSantis, Royal Oak, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

Filed Sep. 8, 1977, Ser. No. 831,372
Int. Cl.[2] B30B *11/02*
U.S. Cl. 425—78 16 Claims

1. In a powder compacting apparatus having a table and a single reciprocable ram disposed below said table, a punch and die unitary assembly for compacting powder material to a shaped article comprising a reciprocable punch actuating member, means rigidly coupling said punch actuating member to said ram, a stationary die plate mounted in an aperture in said table and having a die cavity, at least three coaxially arranged independently reciprocable punches associated with said die plate and comprising an outer punch, an intermediary punch disposed within said outer punch, and an inner punch disposed with said intermediary punch, means coupling said punch actuating member to said intermediary punch for upwardly displacing said intermediary punch, a piston-defining annular member peripherally disposed about a portion of said punch actuating member, a fluid actuated cylinder housing disposed peripherally about the annular member of said punch actuating member, said annular member separating said enclosure into opposed chambers for displacing said cylinder housing relative to said punch actuating member upon introduction of fluid into one or the other of said chambers, coupling means between said cylinder housing and said inner punch for upwardly displacing said inner punch, coupling means between said cylinder housing and said outer punch for upwardly and downwardly displacing said outer punch, means for introducing fluid into said cylinder and for exhausting fluid from said cylinder for reciprocating said outer punch and displacing said



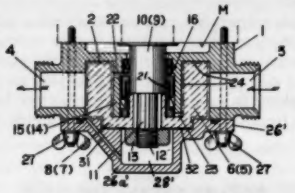
inner punch relative to said intermediary punch, first adjustable abutment means limiting downwardly the motion of said inner punch, second adjustable abutment means limiting downwardly the motion of said intermediary punch, and third adjustable abutment means for said coupling means between said punch actuating member and said intermediary punch.

4,153,400

ROTARY PUMPS CIRCULATING PUMPED FLUID TO SEAL

Kazuo Morita, Hirakata, Japan, assignor to Nakamura Kinzoku Kogyosho, Inc., Hirakata, Japan

Filed Jul. 14, 1977, Ser. No. 815,719
Claims priority, application Japan, Jul. 16, 1976, 51-95223; Jul. 16, 1976, 51-95224
Int. Cl.[2] F04C *1/08, 15/00*
U.S. Cl. 418—102 4 Claims



1. A rotary pump for fluids, part of which can be circulated to a seal for cleaning purposes, comprising a pump casing (1) wherein an inlet (3) constituting the low-pressure side of a pump chamber (2) for a fluid passing through the pump, and an outlet (4) are provided which latter constitutes the high-pressure side; bosses (14, 15) in said chamber, projecting from said casing; driving shafts (9, 10) inserted in said bosses and having free ends (12); rotors (7, 8) about said shafts in said chamber; securing means (13) engaging said free ends to fix said rotors to said shafts; a seal member (16) between said bosses and said rotors; and a cap member (26/26') fixed to said casing to seal said chamber; there being holes (22, 23) passing through said bosses to circulate part of the fluid from said high-pressure side to said low-pressure side of the chamber; wherein said cap member has a projecting part (26a/26a') with a space (28/28') therein, for cleaning by the fluid, in which space said securing

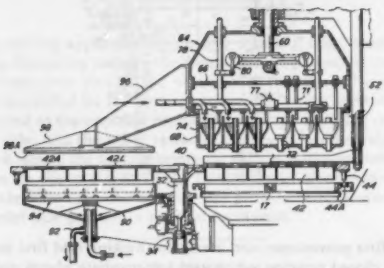
means is disposed; further comprising a circulating passage (31) interconnecting said high-pressure side of the chamber with said space, also for cleaning by the fluid; and a narrow aperture (32) at a contact surface between said cap member and said rotors on the low-pressure side; and there being a space (25) between said bosses and said seal member; and a narrow aperture (24) between said casing and said rotors, said last-named space being also cleaned by the fluid.

4,153,401

EQUIPMENT FOR FILLING MOLDS WITH COLORED MORTARS AND WITH THE AID OF PARTITIONS TO DEFINE PATTERNS ON THE VISIBLE SURFACE

Enrico Longinotti, Via Timoteo Bertelli, 2, Firenze, Italy (I-50133)

Filed Jan. 5, 1978, Ser. No. 867,351
Claims priority, application Italy, Jan. 7, 1977, 9304 A/77
Int. Cl.[2] B28B *13/02*
U.S. Cl. 425—134 **7 Claims**



1. Equipment for filling molds with colored mortars to obtain patterned tiles or the like, in machines for the manufacture of cement tiles and the like in which plural molds are moved cyclically through plural tile forming stations including a mold filling station: said equipment comprising, in combination a unit at the filling station mounting plural mold compartment defining partition units and operable to raise and lower said partition units and to move each partition unit horizontally between an operative position, in which it is aligned with a mold, and a washing position; a batch metering unit at the filling station; means mounting said batch metering unit and operable to raise and lower the same relative to a mold then at said filling station; an assembly of a plurality of small tanks on said batch metering unit operable to receive colored mortars fed thereto and stirred therein; respective discharge tubes extending through the bottoms of said small tanks in alignment with respective compartments of the partition unit then positioned in a mold at said filling station; respective metering cups slidable on said discharge tubes within said tanks; and means connected to said cups and operable to move said cups between a lower position, in which said cups are submerged in the mortars in said tanks, and an upper position, in which cups discharge the mortars therein into the associated discharge tubes for discharge into the respective compartments.

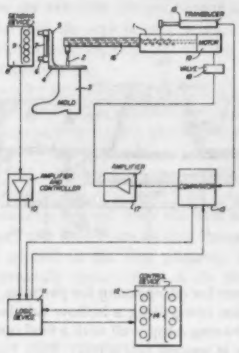
4,153,402

INJECTION APPARATUS CONTROL

Clifford Sanderson, Belleville, Canada, assignor to Bata Shoe Company, Inc., Belcamp, Md.

Filed Apr. 14, 1978, Ser. No. 896,187
Claims priority, application Canada, May 2, 1977, 277382
Int. Cl.[2] B29F *1/03*
U.S. Cl. 425—145 **6 Claims**

1. An injection control apparatus for controlling the quantity of extrudable material dispensed by a metering device of an extruder into a mold comprising a code device for attachment to said mold, the code device being indicative of the volume of a mold cavity in the mold to be filled with the extrudable material; a sensing device for triggering by said code device when in close proximity thereto and for generating a code signal; a controller for receiving and storing said code signal from said sensing device; transducer means coupled to the extruder metering device for sensing the position of the metering device and producing a position signal indicative of such position; logic means for receiving said code signal from said



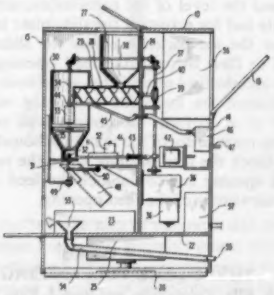
controller; a control device for receiving a signal from said logic means; comparator means for receiving and comparing said position signal from said transducer means and a reference signal from said control device dependent on the code signal to produce a command signal for controlling the quantity of extrudable material dispensed by said metering device.

4,153,403

MACHINE FOR AUTOMATICALLY MAKING PLASTER SLURRY AND DISPENSING IT TO DENTAL MOLDS

Howard S. Schneider, 1871 University Blvd. S., Jacksonville, Fla. 32216

Filed Nov. 18, 1977, Ser. No. 852,901
Int. Cl.[2] B29B *1/06, 5/06*
U.S. Cl. 425—159 **27 Claims**



1. In apparatus for automatically mixing dry dental plaster and water and filling a dental mold with the resulting slurry, the combination includes:

a. mixing chamber means including agitating means for accepting a predetermined quantity of dry plaster and liquid and forming a slurry therefrom

b. means for dispensing a measured amount of said slurry to a dental mold

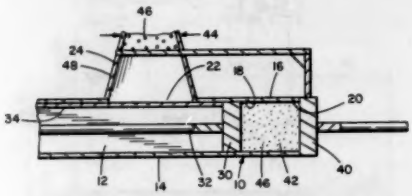
c. and means for introducing a liquid to said mixing chamber means and said dispensing means for flushing out residues of said slurry

4,153,404

APPARATUS FOR PRODUCING UNIFORM BLOCKS OF ICE

Everett S. Ottman, Denton, Tex., assignor to Turbo Refrigerating Company, Denton, Tex.

Filed Sep. 14, 1977, Ser. No. 832,962
Int. Cl.[2] B29G *1/00*
U.S. Cl. 425—256 **6 Claims**



1. A machine for compacting ice particles to form a composite block of ice comprising a hollow tubular member open at one end and having a top wall with a feed opening in which the feed opening is spaced rearwardly from the open end of the tubular member by an amount greater than the length of the ice block, a ram mounted for movement in the tubular member as a piston between retracted position rearwardly of the feed opening and actuated position at the open end of the tubular member, means for actuating the ram between retracted and actuated positions, a second ram mounted in endwise alignment with the hollow tubular member for movement between blocking position at the open end of the tubular member and retracted position spaced forwardly from the open end of the tubular member, and means for actuating the second ram between blocking and retracted positions, a feed hopper on the top side of the tubular member having an outlet opening in the bottom in communication with the feed opening through the top wall of the tubular member with the hopper of pyramidal shape having its base of larger dimension at the bottom in registry with the feed opening through the top wall of the tubular member, a partitioning plate mounted for sliding movement across a portion of the hopper spaced from the outlet between blocking position and unblocking position, means for feeding ice particles into the feed hopper, means for actuating the slide plate to blocking position when the feed opening is closed and the level of ice particles exceeds the level of the slide plate and for actuating the slide plate to unblocking position after the ice particles below the slide plate have been allowed to flow through the feed opening into the tubular member and the feed opening has again been closed, a blocking plate adjacent the underside of the top wall of the tubular member so as to form the bottom wall of the hopper and extending rearwardly of the ram for rebound movement therewith to block the feed opening when the ram is forwardly of the feed opening and to unblock the feed opening when the ram is rearwardly of the feed opening.

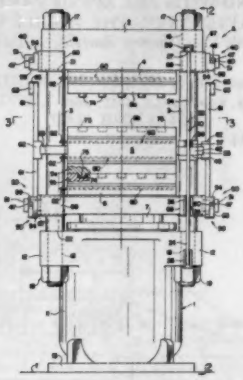
4,153,405

THREE-DECK VULCANIZING PRESS

Robert A. Elly, Painesville, and Sam J. Foti, Lyndhurst, both of Ohio, assignors to Neff-Perkins Company, Painesville, Ohio

Continuation-in-part of Ser. No. 779,492, Mar. 21, 1977, abandoned. This application May 15, 1978, Ser. No. 905,749
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1978, 2812374
Int. Cl.[2] B30B *7/02*
U.S. Cl. 425—338 **6 Claims**

1. In a high pressure press for molding and vulcanizing rubber articles having a frame including a fixed head, a ram mounted for movement toward and away from said head between a retracted position and an advanced position, a fixed platen, an intermediate floating platen and a moveable platen located between said ram and said head, a first vulcanizing mold located between said fixed platen and said intermediate platen and having a first section carried by said fixed platen and a second section carried by said intermediate platen and a second vulcanizing mold located between said intermediate platen and said moveable platen and having a first section carried by said intermediate platen and a second section carried by said moveable platen, each mold having a plurality of mold cavities, means for heating each mold to a vulcanizing temperature, and means for applying pressure to said ram to close both molds, the improvement which comprises:



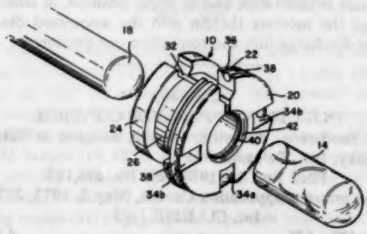
(a) first power-operated means for locking said first mold in a closed position when said intermediate platen and said moveable platen are in the ram-advanced position;
(b) second power-operated means for locking said second mold in a closed position when said intermediate platen and said moveable platen are in the ram advanced position; and
(c) means for causing each of said power-operated means to release its associated mold when locking of the other mold is effected so that one of said molds opens when the moveable platen is moved to its ram-retracted position.

4,153,406

STRIPPER RING FOR A CAPSULE-MAKING MACHINE

Larry E. Dittmann, Harrisburg; Wayne L. Millhimes, Hershey, and Glenn A. Steinhauer, Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 25, 1978, Ser. No. 900,045
Int. Cl.[2] B29C *1/00*; B29D *23/00*
U.S. Cl. 425—438 **7 Claims**



1. In molding apparatus, for forming a hollow article on a mandrel, and having a slotted stripper ring, with a passageway therethrough, for removing said article from said mandrel, the improvement comprising: a spring metal insert embedded in the ring adjacent the front face thereof with the interior edge

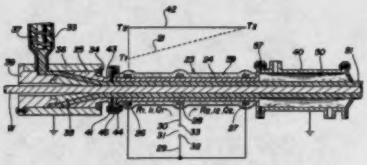
defining at least one surface of the passageway extending through the ring.

4,153,407

CURING APPARATUS

Masaaki Otsuji, 41-2, Oasa-Yoshikawa, Higashinose-mura, Toyono-gun, Osaka, Japan

Filed Mar. 24, 1978, Ser. No. 890,019
Claims priority, application Japan, Mar. 24, 1977, 52-33069
Int. Cl.[2] B29H *9/08*; B29F *3/10*
U.S. Cl. 425—446 4 Claims



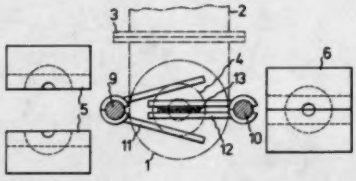
1. A curing apparatus comprising a curing tube, means for heating the curing tube by the direct passage of electric current in the tube over part or the whole of its length, and a power supply provided for the heating means and having one terminal connected to the opposite ends of the voltage applying section of the tube and the other terminal connected to the tube at a position where the voltage applying section is divided into one portion on the inlet side of the tube and the other portion on the outlet side thereof, the inlet-side portion being lower than the outlet-side portion in electric resistance.

4,153,408

PROCESS FOR EXTRUSION BLOWING OF THERMOPLASTIC HOLLOW ARTICLES AND GRIPPER DEVICE FOR DRAWING THE PARISON INTO THE BLOW MOLD

Walter Albert, Frankfurt am Main; Manfred Dicks, Niedernhausen, and Hans O. Schiedrum, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,677
Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623342
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—532 8 Claims



1. A gripper device in an apparatus for forming a hollow article from a thermoplastic parison issuing from an extruder die used in cooperation with a multi-part partible blow mold mounted in said apparatus and having opposing halves which are movable between an open position in which said halves are disposed remotely about said parison and a closed position in which said halves enclose the parison, said device comprising

first and second gripper arms mounted in said apparatus and positioned adjacent of said parison and substantial[1]y parallel thereto, said arms movably mounted for longitudinal reciprocal movement;

two pairs of gripper jaws respectively movably mounted on said gripper arms for movement of the jaws of each pair in a scissors-like manner in relation to one another between an open position in which said jaws are disposed remotely about said parison and a closed position in which said jaws grasp said parison;

arm moving means for cyclically and alternately moving said gripping arms between first and second positions wherein in said first position the pair of jaws of the gripper arm is between the extruder die and the edge of the blow mold nearer to said die and in said second position the jaws of the gripper arm are beyond the edge of the blow mold remote from the die;

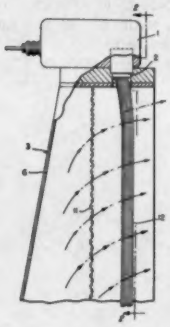
jaw moving means for reciprocating said jaws between their open and closed positions in synchronism with the movement of said arms according to a predetermined sequence wherein the jaws of a gripper arm are closed after the arm arrives at said first position about the parison, held closed during movement of the arm from said first position to said second position, opened after the arm arrives at the second position, and held open during movement of the arm from the second to the first position, whereby the parison is sequentially drawn through the blow mold by said gripper arms.

4,153,409

MELT SPINNING OF SYNTHETIC YARNS

Spencer W. Capps; Gerald E. Hagler, and Agaram S. Abhiraman, all of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed May 4, 1977, Ser. No. 793,504
Int. Cl.[2] B29D *23/06*
U.S. Cl. 425—72 S 7 Claims



1. An apparatus for melt spinning of polymers into synthetic yarns which comprises a spinneret assembly means for extruding molten polymer through spinning orifices spaced apart in a spinning plate to form a plurality of filaments and a blow box means, operatively associated with said spinneret assembly means, for directing a flow of cooling gas transversely across the plurality of filaments that extend vertically downward from the spinning plate, the spinning plate having an operative area wherein at least two groups of a plurality of said orifices are provided, said groups being arranged to provide at least one open lane that extends across the operative area of the plate in a direction parallel to the flow of said cooling gas and the lane having a width greater than the distance between adjacent orifices within each of said groups and the spinning plate having an average of from 2 to 10 orifices per (10 mm.)^2 of the operative area, whereby said plate produces a yarn of a high filament count and of a low denier per filament count that

exhibits a reduced degree of denier unevenness as compared with a yarn of the same filament count and denier produced by a conventional spinning plate having the same operative area.

4,153,410

PRODUCTION OF SULFUR-FREE COMBUSTION GASES OF LOW SOOT CONTENT

Hans Diem, Ludwigshafen; Albrecht Aicher, Frankenthal; Hans Haas; Christian Dudeck, both of Ludwigshafen, and Fritz Finkbeiner, Altrip, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 15, 1977, Ser. No. 851,695

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1976, 2655321

Int. Cl.[2] F23D *13/20*

U.S. Cl. 431—5 **14 Claims**

1. A process for the production of sulfur-free combustion gases of low soot content, which contain by weight from 4.94 to 5.62% of carbon dioxide, from 10.98 to 13.5% of water vapor, from 79.53 to 82.76% of nitrogen, from 0.93 to 1.03% of noble gases and from 0.29 to 0.42% of oxygen, wherein a starting gas mixture which contains by weight from 81.3 to 85% of nitrogen, from 6.4 to 7.5% of carbon dioxide, from 0.2 to 0.9% of carbon monoxide, from 5.9 to 7% of water vapor, from 1 to 1.6% of hydrogen, from 0.02 to 0.1% of formaldehyde, from 0.01 to 0.2% of methanol and from 1.4 to 1.47% of noble gases, at a flow velocity of from 5.5 to 18 meters per second, and air at a flow velocity of from 7.5 to 20 meters per second, are fed through slit-shaped channels of at least one gas burner having such channels to a combustion chamber, the starting gas mixture and the air are mixed with one another, before or during entry into the combustion chamber, in a molar ratio of from 0.39 to 1.29 moles of oxygen contained in the air per mole of hydrogen in the gas mixture, and the resulting mixture is burned at an internal temperature of the combustion chamber of from 560° to 1,200° C., from 1 to 10 burners, and from 2 to 18 slit channels per burner, being employed.

4,153,411

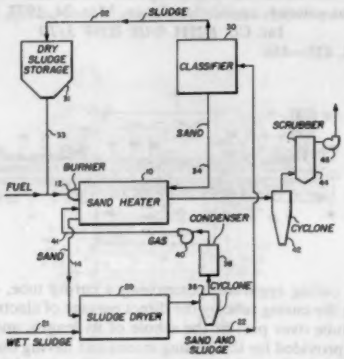
ROTARY SLUDGE DRYING SYSTEM WITH SAND RECYCLE

Maynard C. Isheim, Menlo Park, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Apr. 12, 1978, Ser. No. 895,684

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—27 **8 Claims**



6. A process for drying wet sludge with granular material and burning dry sludge comprising:

a. burning dry sludge to heat the granular material in a heater;

b. transferring the hot granular material to a sludge dryer;

c. mixing the hot granular material with wet sludge in the sludge dryer to substantially dry the wet sludge;

d. transferring the mixture of granular material and substantially dry sludge to a classifier;

e. in the classifier substantially separating the dry sludge from the granular material;

f. transferring the dry sludge from the classifier to the heater to be burned; and,

g. transferring the granular material from the classifier to the heater to be heated.

4,153,412

PROCESS FOR PRINTING REFLECTIVE SHEET MATERIAL

Terry R. Bailey, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 25, 1977, Ser. No. 790,601
Int. Cl.[2] D06P 5/00; G02B 5/128
U.S. Cl. 8—2.5 A 8 Claims

1. A process for imparting colored designs to exposed lens retroreflective sheet material, said material comprising

a support film, at least an outer stratum of which is optically clear, a dense monolayer of transparent microspheres partially embedded in, and partially exposed above, said stratum, with a specularly reflective material disposed adjacent the embedded portions of said microspheres, said stratum comprising an organic binder composition adapted to receive and retain vapor phase dyestuff throughout its thickness, including portions underlying the microspheres, without affecting the retroreflectivity of said sheet material, the process comprising:

(a) disposing a preprinted sublimable dye-containing source sheet over the exposed lens surface of said retroreflective sheet materials, and

(b) applying sufficient pressure to said source sheet to insure intimate contact between said retroreflective sheet material and said source sheet, and

(c) applying sufficient heat to said source sheet to cause sublimation of said sublimable dye into said retroreflective sheet, and

(d) removing the source sheet from the retroreflective sheet,

whereupon said retroreflective sheet material becomes visibly patterned with the pattern on the preprinted source sheet.

4,153,413

COLORATION PROCESS

Susan M. Bostock; Violet Boyd; Brian R. Fishwick; Brian Glover, and Stewart R. Korn, all of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 19, 1977, Ser. No. 862,300
Claims priority, application United Kingdom, Jan. 14, 1977, 1487/77
Int. Cl.[2] C09B 27/00; D06P 1/02
U.S. Cl. 8—41 C 10 Claims

1. A process for the continuous colouration of aromatic polyester or cellulose triacetate textile materials which comprises continuously applying to the said textile materials by an aqueous padding or printing process and fixing by a heat treatment a disperse azo dyestuff, free from carboxylic acid and sulphonic acid groups, which is represented by the formula:

A—N=N—E

wherein A is the residue of a diazotisable aromatic amine A—NH_2 and E is the residue of a coupling component which is an aromatic or heterocyclic amine, an aromatic hydroxy compound, a pyrazolone or an active aliphatic methylene compound, each dyestuff containing a single carboxylic ester group and at least one of the following:

(a) a primary, secondary or tertiary sulphamoyl group;

(b) a primary, secondary or tertiary carbamoyl group;

(c) an imido group;

(d) a hydroxy group;

(e) a sulphone group

(f) a lactone group; and subsequently giving the coloured textile material a treatment in an aqueous alkaline bath at a pH above 8 and at a temperature between 50° and 85° C. which does not contain a reducing agent.

4,153,414

COLD WATER-SOLUBLE ACID DYE COMPOSITION DERIVED FROM THE STANDARDIZATION OF MONO- AND DISAZO ACID DYES WITH AN AMMONIUM LIGNIN SULFONATE

Charles D. Ver Nooy, III, West Chester, Pa., and Armand P. Zinnato, Chattanooga, Tenn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1977, Ser. No. 864,607
Int. Cl.[2] C09B 27/00; D06P 1/02
U.S. Cl. 8—41 R 12 Claims

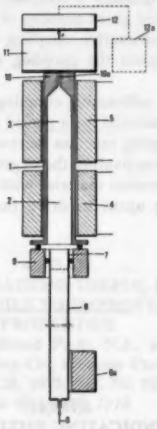
1. A cold water-soluble dye composition consisting essentially of, by weight, from 20 to 70% of a sparingly soluble mono- or disulfonated, mono- or disazo acid dye, substantially in the form of its alkali metal salt, and from 80 to 30% of an ammonium lignin sulfonate.

4,153,415

METHOD FOR DETERMINING OIL-RELATED CHARACTERISTICS OF GEOLOGICAL SEDIMENTS FROM SMALL SAMPLES THEREOF

Jean Espitalie, Le Vesinet; Jean-Loup Laporte, Rueil-Malmaison; Marcel Madec, Suresnes, and François Marquis, Saint-Prix, all of France, assignors to Institut Francais du Petrole, France

Filed Jan. 19, 1977, Ser. No. 760,524
Claims priority, application France, Jan. 20, 1976, 76 01765; Nov. 12, 1976, 76 34402
Int. Cl.[2] G01N 31/12
U.S. Cl. 23—230 EP 10 Claims



1. A method for rapidly evaluating at least one oil-related characteristic of a geological sediment containing native hydrocarbons and insoluble organic materials using small-sized samples thereof, comprising:

(a) heating the sample to a first temperature for vaporizing substantially all the native hydrocarbons contained in the sample, without pyrolyzing the insoluble organic material of this sample,

(b) determining a first parameter representing the amount of these native hydrocarbons,

(c) heating the sample to a second temperature to pyrolyze substantially all the insoluble organic material contained in the sample

(d) determining a second parameter representing the amount of hydrocarbon products resulting from the pyrolysis of the insoluble organic material of the sample, and

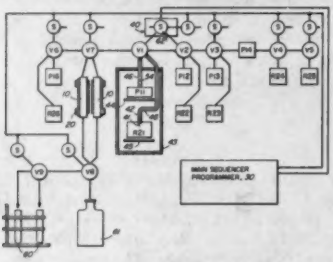
(e) deducing from said two determinations at least one oil-related characteristic of the geological sediment.

4,153,416

PROCESS AND APPARATUS FOR PULSE LABELLING PROTEIN MATERIAL IN THE EDMAN DEGRADATION PROCESS

Alex G. Bonner, 23 Fairway Dr., West Newton, Mass. 02165, and Marcus J. Horn, 1106 Boylston St., Newton Upper Falls, Mass. 02164

Filed Jun. 6, 1977, Ser. No. 803,689
Int. Cl.[2] G01N *1/18;* C07C *103/52*
U.S. Cl. 23—230 A 5 Claims



5. In the Edman process of sequential degradation of protein material wherein the protein material is reacted with a coupling agent, the process steps of

(1) interrupting the degradation process of a given quantity of said protein material and before the coupling reaction of that given quantity is complete;

(2) contacting said given quantity of protein material with a quantity of radioactive coupling agent which is insufficient to complete the coupling reaction of the protein material;

(3) holding the radioactive coupling agent in contact with said protein material for a period predetermined to maximize the coupling reaction therewith, and

(4) thereafter re-activating the degradation process by contacting said protein material with sufficient non-radioactive coupling agent to drive the coupling reaction to completion.

4,153,417

METHOD OF INDICATING RHEUMATOID FACTORS

Henning R. Hällgren, Upplands-Bällinge, and Leif E. Wide, Uppsala, both of Sweden, assignors to Pharmacia Diagnostics AB, Uppsala, Sweden

Filed Jul. 25, 1977, Ser. No. 818,646
Claims priority, application Sweden, Sep. 8, 1976, 7609906
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 2 Claims

1. A method of indicating rheumatoid factors belonging to at least one of the immunoglobulin classes IgM, IgG and IgA in an aqueous sample, which method comprises

(a) pacifying any complement factor C1q present in the sample,

(b) thereafter reacting the sample with soluble, aggregated immunoglobulin labelled with one or more analytically indicatable atoms or groups to form aggregates between rheumatoid factors and the aggregated, labelled immunoglobulin, said aggregates being precipitated out,

(c) separating the precipitate, and

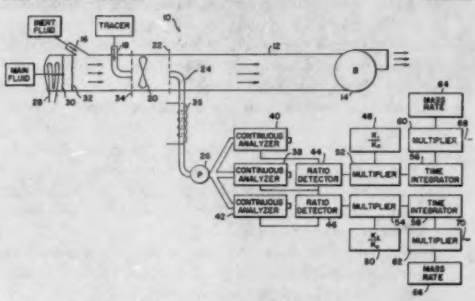
(d) thereafter measuring indicatable atoms or groups in the precipitated phase formed and/or in the solution.

4,153,418

CHEMICAL TRACER METHOD OF AND STRUCTURE FOR DETERMINATION OF INSTANTANEOUS AND TOTAL MASS AND VOLUME FLUID FLOW

Rudy M. Haas, 8171 Forestlawn, Detroit, Mich. 48234

Division of Ser. No. 349,622, Apr. 9, 1973, Pat. No. 3,988,926, which is a continuation-in-part of Ser. No. 141,749, May 10, 1971, Pat. No. 3,727,048. This application Nov. 1, 1976, Ser. No. 737,080
Int. Cl.[2] G01F *1/70;* G01N *31/00*
U.S. Cl. 23—232 R 7 Claims



1. The method of determination of the total mass flow of at least one component of interest in a reacted flowing main fluid in a period of time comprising the introduction of an analyzable tracer component comprising at least one component selected from the group consisting of a fuel and its reaction products at a known mass rate into a flowing main fluid, mixing the tracer component with the flowing main fluid, reacting the mixture of tracer component and the flowing main fluid in a reactor, analyzing the reacted mixture to determine the concentration of at least the tracer component and one component of interest in the reacted mixture, and time integrating the product of the ratio between the component of interest concentration and the tracer concentration, and the mass flow rate of the tracer over the time period in accordance with the formula

$$(m_1)_t = (m_1)_{t1} = \int_{t_1}^{t_2} \frac{C_1}{C_0} \frac{dm_0}{dt} dt$$

where $(m_1)_{t2} - (m_1)_{t1}$ is the total mass flow of the component of interest over the time period t_1 to t_2, dm_o/dt is the mass flow rate of the tracer obtained from knowledge of the mass introduction rate of the tracer, and C_1/C_o is the ratio of the concentration of the component of interest to the concentration of the tracer.

4,153,419

AGGLOMERATION OF COAL FINES

Eric J. Clayfield, Mickle Trafford, near Chester; Clive Pinnington, Farndon, near Chester; Michael J. Cannon, Chester, and Peter Sant, Wirral, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 28, 1977, Ser. No. 855,510
Claims priority, application United Kingdom, Dec. 3, 1976, 50506/76
Int. Cl.[2] C10L *5/16, 5/40*
U.S. Cl. 44—23 22 Claims

1. Process for the agglomeration of coal fines from an aqueous slurry thereof, with simultaneous ash removal where ash is present in the slurry, comprising:

(a) adding an aqueous emulsion of an oil fraction to said slurry,

(b) agitating said emulsion and said slurry to form agglomerates and remaining slurry,

(c) removing agglomerates formed, from the remaining slurry,

(d) adding additional aqueous emulsion of an oil fraction to the remaining slurry,
(e) agitating said emulsion and said remaining slurry to form agglomerates and remaining liquid, and
(f) removing the agglomerates from the remaining liquid.

4,153,420

PROCESS FOR WET CARBONIZING OF PEAT

Bertel Myreen, Abo, Finland, assignor to Ra Shipping Ltd. Oy, Pargas, Finland

Filed Mar. 27, 1978, Ser. No. 890,702
Claims priority, application Finland, Apr. 19, 1977, 771235
Int. Cl.[2] C10F *5/00, 7/00;* C10B *57/12*
U.S. Cl. 44—33 7 Claims

1. A process for wet carbonizing of peat, which comprises
preparing a pumpable aqueous suspension of raw peat,
preheating said suspension in series-connected heat exchangers and in a preheating tower,
feeding the preheated suspension into a reactor to be wet carbonized therein,
introducing steam from a steam boiler into said reactor for the wet carbonizing of the peat suspension at a temperature of about 200° C.,
cooling the wet carbonized peat suspension by heat exchange in the preheating tower,
dewatering mechanically the cooled peat suspension in a dewatering apparatus,
drying the dewatered peat suspension in a drying apparatus, hot exhaust gases from the boiler being introduced as drying gas into the drying apparatus,
purifying and cooling in a wet separator exhaust gas emerging from the drying apparatus and containing dust and water vapour, part of said water vapour being condensed in said wet separator, polluted water coming from the dewatering apparatus being cooled by heat exchange with the raw peat suspension in the heat exchanger and, thereupon, being introduced as washing water into said wet separator, and
returning dust-laden and heated drain water from the wet separator to the suspension preparing apparatus to be used as dilution water therein.

4,153,421

STABILIZED FUEL SLURRY

Louis A. Marlin, Crestwood, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed May 17, 1976, Ser. No. 687,146
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 11 Claims

1. A method of preparing a stabilized fuel slurry having liquid fuel oil present in the range of from about 30% by weight to about 70% by weight, solid fuel particles with diameters as large as about ¼ inch percent in the range of from about 25% by weight to about 65% by weight, water present in the range of from about 1% by weight to about 30% by weight and an emulsifier selected from the class of polysaccharides consisting of modified starch, modified cellulose and dextrin capable of forming a water internal-high oil external phase emulsion present in the range of from about 0.1% by weight to about 10% by weight, said method comprising providing a liquid fuel oil, adding the emulsifier and solid fuel particles having diameters as large as two inches and water to the liquid fuel oil, and agitating the solid fuel particles in the liquid medium to form a water internal-oil high external phase emulsion and a stabilized fuel slurry having solid fuel particles with diameters no larger than about ¼ inch, wherein the majority of solid fuel particles are retained on a 70 mesh screen, the solid fuel particles staying substantially dispersed throughout the liquid medium for a extended period of time.

4,153,422

POLYMER COMBINATIONS USEFUL IN DISTILLATE HYDROCARBON OILS TO IMPROVE COLD FLOW PROPERTIES

Max J. Wisotsky, Highland Park, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 7, 1975, Ser. No. 565,748
Int. Cl.[2] C10L *1/18*
U.S. Cl. 44—62 3 Claims

1. A fuel oil consisting of a wax containing atmospheric middle distillate petroleum fuel oil boiling in the range of 120° to 480° C., having at least 30 wt. % boiling between about 120° to about 230° C. and at least 5 wt. % boiling above 350° C., said oil having a viscosity of 1.6 to 7.5 centistokes at 38° C. and leaving less than 3 wt. %, based on the total weight of the fuel, of n-paraffin wax boiling above 350° C. and separable from said oil at a temperature of about 7° C. below the cloud point of said oil, said oil containing in the range of about 0.005 to 0.1 wt. %, based on the weight of the total composition, of a synergistic flow improving combination of (a) one part by weight of an oil soluble ethylene-ester copolymer having a number average molecular weight less than about 4000 per (b) 0.2 to 4 parts by weight of an oil-soluble polyester having a number average molecular weight in the range of about 2000 to 100,000;
wherein said ethylene-ester copolymer consists essentially of 4 to 20 molar proportions of ethylene with a molar proportion of vinyl acetate; and
wherein said polyester consists of alkyl acrylate or alkyl methacrylate moieties, and said moieties consist essentially of C_{14} to C_{16} straight chain alkyl ester of acrylic or methacrylic acid.

4,153,423

POLYMER COMBINATIONS USEFUL IN DISTILLATE HYDROCARBON OILS TO IMPROVE COLD FLOW PROPERTIES

Max J. Wisotsky, Highland Park, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 28, 1975, Ser. No. 562,892
Int. Cl.[2] C10L *1/18*
U.S. Cl. 44—62 5 Claims

1. A fuel oil consisting of a middle distillate petroleum fuel oil boiling in the range of 150° C. to 400° C., and having at least about 5 wt.% boiling at a temperature greater than 350° C., which has been improved in its low temperature flow properties, containing in the range of about 0.005 to 0.1 wt.%, based on the weight of the total composition, of a synergistic flow improving combination of (a) one part by weight of an oil soluble ethylene backbone polymer having a number average molecular weight in the range of about 5000 up to 20,000 per (b) 0.2 to 4 parts by weight of an oil soluble polyester having a molecular weight in the range of about 2000 to 200,000;
wherein said ethylene backbone polymer consists essentially of 4 to 20 molar proportions of ethylene with a molar proportion of ethylenically unsaturated alkyl ester selected from the group consisting of isobutyl acrylate and 2-ethylhexyl acrylate; and,
wherein said polyester consists of monomer moieties of alkyl ester of acrylic or methacrylic acid, said monomer moieties consisting essentially of C_8 to C_{16} straight chain alkyl ester of acrylic or methacrylic acid.

4,153,424
POLYMER COMBINATIONS USEFUL IN DISTILLATE HYDROCARBON OILS TO IMPROVE COLD FLOW PROPERTIES

Max J. Wisotsky, Highland Park, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 563,077, Mar. 28, 1975, abandoned.
This application Apr. 22, 1977, Ser. No. 789,852
Int. Cl.[2] C10L *1/18*
U.S. Cl. 44—62 **4 Claims**

1. A fuel oil consisting of a middle distillate petroleum fuel oil boiling in the range of about 150° C. to about 400° C., and of which at least 5 wt. % boils above 350° C., which has been improved in its low temperature flow properties, containing in the range of about 0.001 to 1.0 wt. %, based on the weight of the total composition, of a synergistic flow improving combination of (a) one part by weight of an oil soluble ethylene backbone polymer having a number average molecular weight of about 1,000 to about 4,000 per (b) 0.2 to 4 parts by weight of an oil soluble polyester having a number average molecular weight in the range of about 2,000 to 100,000;

wherein said ethylene backbone polymer is a copolymer consisting essentially of 4 to 20 molar proportions of ethylene with a molar proportion of isobutyl acrylate; and,

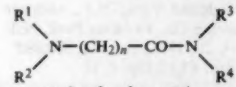
wherein said polyester consists of alkyl acrylate or alkyl methacrylate moieties, said moieties consisting essentially of C_8 to C_{16} straight chain alkyl ester of acrylic or methacrylic acid.

4,153,425
ω-DISUBSTITUTED AMINO ALKANOIC ACID-N-AMIDES AS FUEL ADDITIVES

Heinz Graefje, Ludwigshafen; Guenther Nottes, Limburgerhof; Herbert Mueller, Frankenthal; Guenther Daumiller, Ziegelhausen, and Herwig Hoffmann, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 21, 1976, Ser. No. 697,771
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1975, 2531469
Int. Cl.[2] C10L *1/18;* **C07C** *103/18;* **C10L** *1/22*
U.S. Cl. 44—71 **3 Claims**

1. A composition of matter comprising predominantly gasoline for Otto cycle engines and an amount effective for cleaning Otto cycle engine carburetors of an ω-N-disubstituted aminoalkanoic acid N'-diamide of formula



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in which each of R^1, R^2, R^3 and R^4 represents branched-chain or straight-chain alkyl of from 7 to 20 carbon atoms, R^2 and R^4 may also denote phenyl, alkyl-substituted phenyl and benzyl, the total number of carbon atoms in R^1 and R^2 and in R^3 and R^4 being at least 16 in each case, and n is a number from 3 to 5.

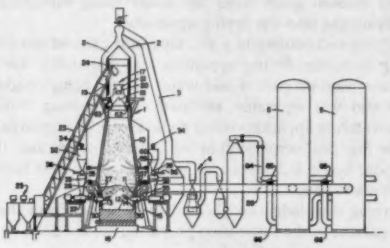
4,153,426
SYNTHETIC GAS PRODUCTION

Reginald Wintrell, Brecksville, Ohio, assignor to Arthur G. McKee & Company, Independence, Ohio

Filed Jul. 18, 1977, Ser. No. 816,360
Int. Cl.[2] C01J *3/20*
U.S. Cl. 48—73 **41 Claims**

1. A method of manufacturing synthetic gas having a substantial calorific content, in a large volume slag type shaft furnace such as a blast furnace having a hearth in the lower portion thereof and a shaft above the hearth, which method comprises charging through the top of said furnace charge material comprising particulate solid carbonaceous material and slag-producing flux material in a size range of particles of material normally charged into a blast furnace in conventional blast furnace practice, to form a body of said charge material in the shaft of said furnace, introducing finely divided solid carbonaceous material and oxygen-containing gas into pre-ignition gasification chamber means that discharges into said furnace above said hearth while pre-igniting and commencing gasification of said finely divided carbonaceous material in said oxygen-containing gas in said pre-ignition chamber means so as to discharge into said furnace from said pre-ignition chamber means hot products of gasification and unburned finely divided carbonaceous material at a temperature high enough to enable substantially all carbon in said finely divided carbonaceous material to combine with available oxygen in said furnace to produce hot gas of substantial calorific content that moves upwardly through said body of charge material; discharging steam into said body of charge material at a location in the furnace where the furnace temperature is sufficient to cause reaction between said steam and carbon in said carbonaceous material in said body of charge material to produce hydrogen and carbon monoxide which are added to said gas; discharging liquid carbonaceous material into said shaft of said furnace at a location whereat the gas in said furnace is at a temperature high enough to crack said liquid carbonaceous material and lower the temperature of said gas; and thereafter withdrawing the resulting synthetic gas from the top of said furnace.

29. A shaft furnace of the type in which charge material including carbonaceous material is charged into the upper portion of the furnace and oxygen containing gas is introduced into the lower portion of the furnace, said furnace comprising



a hearth in the lower portion of the furnace, a shaft above the hearth, charging means at the upper portion of said shaft by which charge material essentially comprising particulate solid carbonaceous material and slag-producing flux material is introduced into said furnace to produce in said furnace a body of charge material essentially comprising only said particulate solid carbonaceous material and said flux material; pre-ignition gasification chamber means opening into said furnace above said hearth and associated with means for introducing into said pre-ignition chamber means finely divided solid carbonaceous material and oxygen-containing gas, said pre-ignition chamber means being adapted to operate to ignite, heat, burn, and gasify said finely divided carbonaceous material introduced into said pre-ignition chamber means at a temperature between about 3000° F. and 3600° F., and to discharge into said furnace hot reducing gases along with unburned finely divided carbonaceous material from said pre-ignition chamber means at a temperature high enough to enable substantially all carbon in the carbonaceous material in said furnace in the vicinity of the location of discharge into said furnace from said pre-ignition chamber means to combine with available oxygen in said furnace in said vicinity to produce in said furnace hot gas of substantial calorific content that passes upwardly through said body of charge material in said furnace, said pre-ignition chamber means being adapted to discharge said unburned finely divided carbonaceous material into said furnace at a temperature at least approximating the temperature of the carbonaceous material in the body of charge material in the furnace in the vicinity of the location of discharge into the furnace from

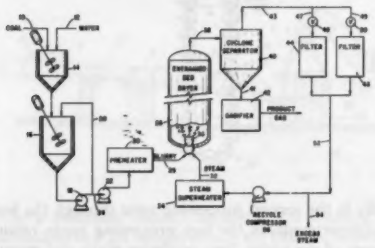
said pre-ignition chamber means; means for discharging steam into said furnace above said hearth portion and above and separate from the location at which said pre-ignition chamber means discharges into said furnace; and means at the upper portion of said furnace for withdrawing gas so produced in said furnace.

4,153,427

APPARATUS AND METHOD FOR FEEDING COAL INTO A COAL GASIFIER

Larry A. Bissett; Gary R. Friggens, and James P. McGee, all of Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 23, 1978, Ser. No. 880,820
Int. Cl.[2] C10J *3/50*
U.S. Cl. 48—86 R **9 Claims**



1. Apparatus for feeding coal into a gasification means operable at a greater than atmospheric pressure comprising mixing means for forming a slurry of coal and water, pumping means coupled to said mixing means for pumping said slurry to a pressure sufficient for introduction into the gasification means, heating means for providing steam at a temperature sufficient to vaporize the water in said slurry and at a pressure greater than the entrained bed dryer pressure, an elongated coal drying chamber, conduit means for separately conveying the slurry and the steam into said chamber adjacent to one end thereof, mixing means within said chamber connected to said conduit means for thoroughly mixing together the slurry and steam immediately upon contact within said chamber to effect vaporization of the water from the slurry without excessively heating the coal to prevent agglomeration of the coal and deposits of tars within said chamber, separating means coupled to said chamber adjacent the opposite end thereof for separating the coal from said steam, and conduit means for conveying the separated coal into the gasification means.

4,153,428

PREPURIFICATION OF TOLUENE DEALKYLATION EFFLUENT GAS

John B. Saunders, Tonawanda, and James S. Davis, North Tonawanda, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 30, 1977, Ser. No. 829,060
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—26 **19 Claims**

1. A process for separation of water and cyclic hydrocarbons from a gas mixture containing hydrogen, methane and said water and cyclic hydrocarbons, comprising:

(a) providing an adsorption zone including two adsorbent beds connected in series, one of said beds containing an adsorbent selective for cyclic hydrocarbons and the other bed containing an adsorbent selective for water;

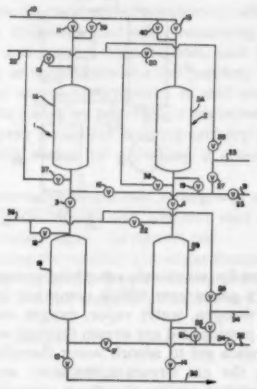
(b) sequentially passing said gas mixture through the adsorbent beds for preferential adsorption therein of cyclic hydrocarbons and water and discharging cyclic hydrocarbon-and water-depleted gas mixture from said adsorption zone;

(c) heating hydrogen-rich gas substantially free of cyclic hydrocarbons as purge gas and passing same through the bed containing cyclic hydrocarbon-selective adsorbent having previously been at least partially loaded with cyclic hydrocarbons by passage of said gas mixture therethrough, thereby desorbing substantially all of the cyclic hydrocarbons and discharging cyclic hydrocarbon-containing purge gas therefrom;

(d) heating an aliphatic hydrocarbon-rich gas substantially free of water as purge gas and passing same through the bed containing water-selective adsorbent having previously been at least partially loaded with water by passage of said gas mixture therethrough, thereby desorbing substantially all of the water and discharging water-containing purge gas therefrom; and

(e) cooling the desorbed adsorbent beds of steps (c) and (d), for subsequent passage of said gas mixture therethrough in the manner of step (b).

18. A process for separation of water and cyclic hydrocarbons from a gas mixture at superatmospheric pressure containing hydrogen, methane and said water and cyclic hydrocarbons, comprising:



(a) providing two adsorption zones each including two adsorbent beds connected in series, one of said beds containing an adsorbent selective for cyclic hydrocarbons and the other bed containing an adsorbent selective for water;

(b) sequentially passing said gas mixture at superatmospheric pressure through the absorbent beds in a first adsorption zone for preferential adsorption therein of cyclic hydrocarbons and water and discharging cyclic hydrocarbon-and water-depleted gas mixture from said first adsorption zone;

(c) separating the cyclic hydrocarbon-and water-depleted gas mixture into hydrogen-rich gas and methane-rich gas;

(d) depressurizing the adsorbent beds in the second adsorption zone through which said gas mixture at superatmospheric pressure has previously been passed for preferential adsorption therein of cyclic hydrocarbons and water, from said superatmospheric pressure to a first lower pressure;

(e) heating a portion of said methane-rich gas as purge gas and passing same at said first lower pressure through the depressurized bed containing water-selective adsorbent in the second adsorption zone, having previously been at least partially loaded with water by passage of said gas mixture therethrough, thereby desorbing substantially all of the water and discharging water-containing purge gas therefrom;

(f) repressurizing the adsorbent beds in said second adsorption zone to said superatmospheric pressure;

(g) heating a portion of said hydrogen-rich gas as purge gas and passing same at said superatmospheric pressure through the bed containing cyclic hydrocarbon-selective adsorbent in the second adsorption zone having previously been at least partially loaded with cyclic hydrocarbons by passage of said gas mixture therethrough, thereby desorbing substantially all of the cyclic hydrocarbons and discharging cyclic hydrocarbon-containing purge gas therefrom; and

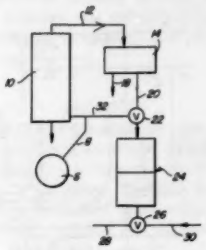
(h) cooling the desorbed adsorbent beds of steps (e) and (g), for subsequent passage of said gas mixture therethrough in the manner of step (b).

4,153,429

SELECTIVE ADSORPTION OF NO_x FROM GAS STREAMS

William G. Matthews, Hartsdale, N.Y., and Herbert C. Shaw, Mobile, Ala., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 21, 1975, Ser. No. 579,627
Int. Cl.[2] B01D *53/02*
U.S. Cl. 55—68 **3 Claims**



1. Process for selectively adsorbing gaseous oxides of nitrogen from a gas stream which comprises in addition to said oxides of nitrogen, water vapor, oxygen and nitrogen which comprises passing said gas stream through an adsorbent bed of activated silica gel to adsorb water therefrom and thereafter contacting the gas stream constituents unadsorbed by said silica gel with a zeolite adsorbent comprising zeolite Y ion exchanged with non-metallic ions consisting essentially of NH_4+ or $H+$ or mixtures thereof having a SiO_2/Al_2O_3 molar ratio of from 4.5 to 5.5, containing from 8 to 30 equivalent percent metal cations in association with AlO_4- tetrahedra of the zeolite framework, at least 8 equivalent percent of said metal cations being sodium cations, said zeolite having been calcined at a temperature of from 400° C. to 800° C. to reduce the unit cell size and to obtain a unit cell size, a_o, to a value of from greater than 24.55 to 24.63 Angstrom units, whereby oxides of nitrogen are adsorbed and separated from the nitrogen and oxygen present.

4,153,430

PROCESS AND APPARATUSES FOR CONTACTING A GAS PHASE AND A LIQUID PHASE

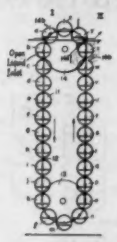
Chen-Yen Cheng; Yu-Ling Cheng, and Wu-Cheng Cheng, all of 9605 La Playa St., NE., Albuquerque, N. Mex. 87111

Filed Jun. 9, 1976, Ser. No. 694,464
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—84 **4 Claims**

1. A process of contacting at least a first gas stream with a liquid phase to produce a second gas stream in a processing system which comprises a first processing zone and a second processing zone, multitude of compartments spaced apart and transmission means for revolving the compartments around a peripheral path; each processing zone having an upper end and a lower end and filled with liquid therein and the upper ends of the two processing zones being respectively communicating with the first gas stream and the second gas stream, each compartment having an imperforate confining wall of a shape to retain a volume of gas therein and an opening at the lower portion of the confining wall for admitting gas and liquid into the compartment, that comprises:

(1) a first step of introducing a quantity of the first gas into a compartment near the upper end of the first processing zone communicating with the first gas stream and moving the compartment downwardly into the liquid and repeating the step successively for each of the successive compartments to form a gas-liquid interface with a volume of retained gas therein,

(2) a second step of revolving the compartments in the system downwardly in the first processing zone and upwardly in the second processing zone through the liquid, the compartments in the two processing zones retaining volumes of gas under their confining walls and maintaining gas-liquid interfaces between the retained gas and the liquid phase to provide the desired gas-liquid contact, and



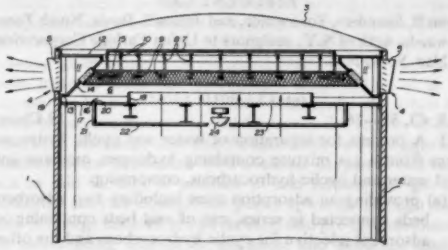
(3) a third step of removing gas from a compartment near the upper end of the second processing zone communicating with the second gas stream and repeating the step for each of the successive compartments, the gas removed becoming at least a part of the second gas stream; the net buoyancy-gravity force acting on the compartments of the first processing zone and the net buoyancy-gravity force acting on the compartments of the second processing zone aiding in counterbalancing each other through the transmission means to reduce the power input needed in the system.

4,153,431

PROCESS AND APPARATUS FOR CLEANING PRILLING TOWER EFFLUENT

John T. Higgins, Trail, Canada, assignor to Cominco Ltd., Vancouver, Canada

Filed Oct. 7, 1977, Ser. No. 840,316
Claims priority, application Canada, Oct. 21, 1976, 263866
Int. Cl.[2] B01D *47/06*
U.S. Cl. 55—85 **12 Claims**



1. Process for removing particulate material from a dust laden gas exhausting from the top of a prilling tower, which

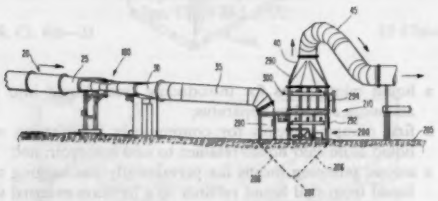
comprises passing the dust laden gas through an aqueous scrubbing liquid spray and thence through a filter while simultaneously directing the scrubbing liquid spray against the filter in the same direction as the flow of the gas for maintaining the filter in a continuously wetted and irrigated state, and passing cleaned gas from the downstream side of the filter out of the top of the tower.

4,153,432

APPARATUS AND METHOD FOR COLLECTION OF CONTAMINANTS

Donald K. Beman, New York; Edward A. Faccioli, Grandview, and David B. Rimberg, Congers, all of N.Y., assignors to Certain-teed Corporation, Valley Forge, Pa.

Filed Mar. 31, 1977, Ser. No. 783,224
Int. Cl.[2] B01D *47/10*
U.S. Cl. 55—90 **25 Claims**



1. In a pollution control apparatus for treating airborne contaminants in a gas stream which are emitted from the forming section of an apparatus for the manufacture of fiberglass, said gas stream comprising nucleated contaminants, gaseous contaminants, entrained liquor carryover and extraneous submicron contaminants, said pollution control apparatus having a housing having a gas inlet and a gas outlet, a liquor-filled sump portion in said housing forming a sump liquor surface, and a fixed venturi portion which together with said liquor surface define a passageway for said gas stream, the improvement which comprises:

a first media means disposed in said passageway adjacent said gas outlet for collecting nucleated contaminant and said gaseous contaminant, said first media means having an underside and a top portion;

first media spray means for irrigating said underside of said first media means by providing a cocurrent spray;

second media spray means for washing said top portion of said first media means by providing a countercurrent spray;

second media means disposed in said passageway subsequent to said first media means and adjacent said gas outlet for collecting entrained liquor carryover from said gas stream; and

means for regulating the velocity of said gas stream through said first and second media means, wherein said velocity of said gas stream is in the range of about 480 to 630 feet per minute.

8. An apparatus for treatment of airborne contaminants emitted from the forming section during the manufacture of fiberglass wherein said airborne contaminants from said forming section are carried in a gas stream which comprises submicron particulate contaminant and gaseous contaminant, comprising:

a source conduit positioned near said forming section;

forming fan means for drawing said gas stream into said source conduit and moving said gas stream through said apparatus;

an inline convergence tube communicating with said source conduit and including an inlet conduit having a generally cylindrical inlet portion and a second subsequent portion of reduced diameter, a third portion contoured to communicate with said cylindrical inlet portion and said second subsequent portion, a fourth subsequent portion having substantially the same diameter as said cylindrical inlet portion and providing an outlet for said gas stream, a fifth portion contoured to communicate with said second subsequent portion of said fourth subsequent portion, and first and second means comprising first and second liquor spray means arranged in said cylindrical inlet portion and in said fourth subsequent portion, respectively, for contacting an aerosol screen of highly concentrated fine droplet spray of liquor with said gas stream in a direction countercurrent to that of said gas stream at a generation velocity in the range of about 5,000 to 15,000 feet per minute, and said forming fan means moves said gas stream and airborne contaminants through said cylindrical inlet conduit portion of said inline convergence tube at a rate in the range of 2,500 to 5,000 feet per minute, whereby said inline convergence tube nucleates said airborne contaminants, said airborne contaminants now comprising large nucleated contaminants, other remaining nucleated contaminants, gaseous contaminants, and entrained liquor carryover;

a housing having a gas inlet and a gas outlet, said inlet in communication with said fourth portion of said inline convergence tube;

a modified venturi sump means for collecting said large nucleated contaminant and for providing a liquor filled reservoir in said housing;

first media means disposed in said passageway adjacent said gas outlet for collecting said other remaining nucleated contaminants and gaseous contaminants, said first media means having an underside and a top portion;

first media spray means for irrigation of said underside of said first media means by providing a cocurrent spray;

second media spray means for washing said top portion of said first media means by providing a countercurrent spray;

second media means disposed in said passageway subsequent to said first media means and adjacent said outlet for collecting entrained liquor carryover; and

means for regulating the velocity of said gas streams through said first and second media means wherein said velocity of said gas stream is in the range of about 480 to 630 feet per minute.

4,153,433

METHOD AND APPARATUS FOR FILTERING OUT SOLID PARTICLES FROM A GAS WITH PEAT LITTER

Christer Kihlström, Pl. 3014, Skara, Sweden (532 00)

Filed Mar. 30, 1977, Ser. No. 782,954
Claims priority, application Sweden, Mar. 31, 1976, 7603809
Int. Cl.[2] B01D *46/00, 46/12*
U.S. Cl. 55—97 **10 Claims**

1. A method of filtering out solid particles from a gaseous medium comprising feeding the gaseous medium into a housing having at least one bed of stratified peat litter, said bed comprising at least a first and a second layer of peat litter, each with mutually different particle sizes, said first layer containing peat litter from a large-size screening series, said second layer containing peat litter from a fine-size screening series; passing the gaseous medium through said first layer first and thereafter

through said second layer; and removing the gaseous medium from said housing.

4,153,434

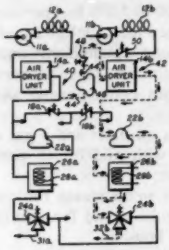
EMERGENCY STANDBY AIR DRYING BACK-UP SYSTEM

Bernard W. Settlemyer, Longmont, Colo., assignor to General Cable Corporation, Greenwich, Conn.

Continuation-in-part of Ser. No. 674,426, Apr. 7, 1976, abandoned. This application May 25, 1978, Ser. No. 909,383

Int. Cl.[2] B01D *53/04, 53/26*

U.S. Cl. 55—163 **13 Claims**



1. In a gas-drying system including two dehumidifiers, one of which operates as a primary system and the other of which serves as a standby back-up system, and each of which includes an air dryer unit and each of which constitutes a self-contained system that can supply the full demand for dry gas to a place of use when the other system is not in operation and for indefinite periods of time such as a day or a plurality of successive days, each dehumidifier having means for connecting it with a source of gas, to be dehumidified, the improvement which comprises a bleed connection through which gas flows from the downstream side of the air dryer unit of the primary dehumidifier to the upstream side of the air dryer unit of the standby system when said standby system is not in operation but ready to operate for supplying the full demand for dry gas to the place of use when and if the primary system is shut down because of mechanical failure or for other reasons, piping through which both the primary system and the standby system can supply dry gas to the same place of use, and means for supplying through said bleed connection, a predetermined amount of dry gas when the primary system is in operation, and the standby system is not in operation, to maintain dynamic conditions necessary to keep the standby system in ready condition for instant takeover from the primary system when the primary system is suddenly shut down.

4,153,435

AMMONIA ABSORBER

William A. Fischer, 2161 S. Platte River Dr., Denver, Colo. 80223

Filed Jun. 7, 1976, Ser. No. 693,148

Int. Cl.[2] B01D *47/00*

U.S. Cl. 55—227 **5 Claims**

2. An ammonia absorber apparatus for cleansing air containing ammonia vapor, comprising:

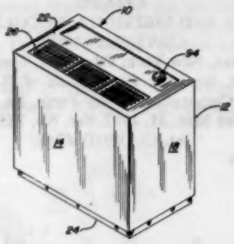
a plenum with an air inlet opening therein for introducing air into said apparatus and an air outlet opening therein for exhausting air from said apparatus;

a chamber inside said plenum also having an air inlet opening therein for exhausting said air from said chamber;

a fan in an enclosed housing, a first duct connecting said air inlet opening in said plenum to said housing, and a second duct connecting said housing to said air inlet opening in said chamber;

a reservoir for ammonia absorbing liquid in the form of a substantially horizontal pan at least equal in horizontal cross-section with said chamber and mounted above and adjacent to said chamber and having a perforated bottom for allowing said ammonia absorbing liquid to flow under gravity from said reservoir in the form of a shower through said chamber;

a liquid retainer under and adjacent said chamber for collecting said liquid and temporarily storing it for recycling through said reservoir and said chamber and for discharge from said ammonia absorber apparatus;



a liquid inlet means for introducing fresh liquid into the ammonia absorber apparatus;

a first pumping means for continuously transferring said liquid from said liquid retainer to said reservoir; and

a second pumping means for permanently discharging said liquid from said liquid retainer to a location external said ammonia absorber apparatus, said liquid inlet means and said first and second pumping means cooperating to maintain a continuous supply of said liquid in said reservoir.

4,153,436

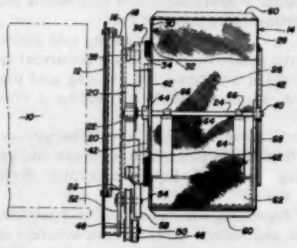
AIR TUBULATOR ON ROTARY SCREEN

Mark L. Cozine, East Earl; John J. Komancheck, and John D. Riffanacht, both of New Holland, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 24, 1978, Ser. No. 889,624

Int. Cl.[2] B01D *46/26*

U.S. Cl. 55—290 **5 Claims**



1. A rotary tubular screen of mesh material operable to prevent the passage of extraneous ambient matter and otherwise operable with a cooling air intake for an internal combustion engine comprising support means having an opening therethrough and supporting a shaft and adapted to be mounted adjacent a radiator for an internal combustion engine and a suction fan associated therewith to draw cooling atmospheric air through said radiator, a screen which is circular in cross-section, means to mount said screen on said support at said opening for rotary motion, said screen being closed at the opposite end by mesh material, a shaft mounted centrally within said screen, and an arcuate baffle freely suspended with said screen from said shaft, auxiliary drive means engaged with said screen to rotate the same about an axis extending outward from a radiator of an internal combustion engine, and seal means between said screen and said support means; the improvement in combination with said screen comprising longi-

tudinally extending vane means projecting outwardly from the circumference of said screen and operable to produce turbulence in the air surrounding said screen when the same is rotated by generating eddy currents adjacent said screen to prevent extraneous ambient matter extending the operation of the engine to adhere upon said screen.

4,153,437

REMOVAL AND RECOVERY OF SULFUR DIOXIDE FROM STACK GASES

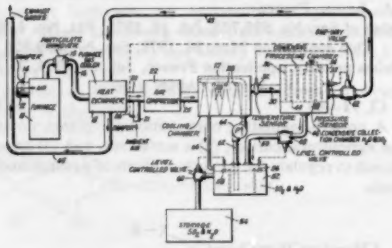
Lee J. Duvall, 1855 Trevilian Way, Louisville, Ky. 40205

Continuation-in-part of Ser. No. 735,311, Oct. 29, 1976, Pat. No. 4,078,390, which is a continuation of Ser. No. 603,814, Aug. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 549,150, Feb. 12, 1975, Pat. No. 3,994,706. This application Nov. 28, 1977, Ser. No. 855,153

The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.

Int. Cl.[2] F25J *3/00*

U.S. Cl. 62—21 **12 Claims**



1. The method for modification of a gaseous effluent, emitted upon combustion of sulfur-containing materials in a furnace having a predetermined optimum flow rate of air thereto for most efficient operation thereof, by removal and recovery of sulfur dioxide and water vapor from said effluent prior to discharge thereof to the atmosphere, said method comprising the steps of:

(a) cooling said gaseous effluent to within a temperature within a range of from about 1° C. to about 25° C.;

(b) compressing said gaseous effluent to a pressure within the range of from about 2 inches of water gauge up to about 100 psig;

(c) sensing the pressure of the cooled and compressed effluent;

(d) sensing the temperature of the cooled and compressed effluent;

(e) liquefying sulfur dioxide and water vapor entrained in said effluent by maintaining the temperature/pressure relationship of said cooled and compressed effluent below the thermodynamic equilibrium point for liquefaction of sulfur dioxide and water vapor from said effluent, to yield a modified residuum effluent essentially free from sulfur dioxide and water;

(f) controlledly discharging said modified residuum effluent to the atmosphere through discharge flow means in response to the sensed pressure and temperature of said cooled and compressed effluent whereby said temperature/pressure relationship is maintained by adjusting the volume flow rate of modified residuum effluent discharged;

(g) admitting a volume of air through damper flow means to said effluent upstream of said discharge flow means to directly compensate for increases and decreases in the volume flow rate of modified residuum effluent discharged, whereby surging through the furnace is precluded, thus maintaining constant said optimum flow rate of air thereto while allowing the adjustment of the volume flow rate of modified residuum effluent discharged; and,

(h) contacting said effluent with sulfur dioxide and water condensate prior to said liquefying step.

4,153,438

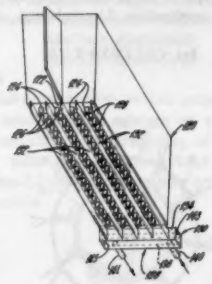
METHOD AND APPARATUS FOR CONTROLLING THE VISCOSITY OF GLASS STREAMS

Ralph M. Stream, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 3, 1974, Ser. No. 511,541

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—2 **16 Claims**



1. The method of processing glass including flowing streams of glass from orifices in a feeder containing heat-softened glass, establishing environmental control at the regions of the streams of glass adjacent the stream flow orifices including a hollow imperforate body containing a small amount of vaporizable liquid and providing a vaporizing zone in heat-transferring relation with the glass streams, vaporizing the liquid in the vaporizing zone by heat absorbed from the glass streams, and condensing the vapor in a condensing zone in communication with the vaporizing zone.

14. A glass fiber forming unit comprising in combination a container for the reception of molten glass, a plurality of orifices on the bottom of said container arranged in rows, and a pluralty of elongate members comprising a closed heat pipe having vaporizer and condenser sections with a portion of said heat pipe extending between the rows of orifices, said elongate members being mounted at the condenser section thereof on a fluid cooled manifold member.

4,153,439

METHOD FOR THE PRODUCTION OF MINERAL WOOL, ESPECIALLY FOR USE IN BASIC MILIEU

Relja Tomić; Ulf Åberg, and Elis Karlsson, all of Skövde, Sweden, assignors to Rockwool Aktiebolaget, Skovde, Sweden

Filed Jun. 7, 1977, Ser. No. 804,297

Claims priority, application Sweden, Jul. 22, 1976, 7608341

Int. Cl.[2] C03B *37/00*; C03C *13/00, 3/04*

U.S. Cl. 65—2 **10 Claims**

1. A method of producing mineral wool comprising the steps of:

(a) providing a raw material comprising, as an essential ingredient olivine, the remaining components being of such type and present in such amount that the said raw material will have the following composition:

SiO_2		40–60 wt. %
Al_2O_3		1–15 wt. %
CaO		1–6 wt. %
MgO		30–45 wt. %
Iron oxides		1–8 wt. %
Alkali oxides	maximum	2 wt. %

-continued

Other oxides	maximum	2 wt. %;

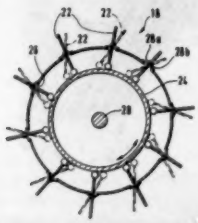
(b) melting said raw material;
(c) forming the molten raw material into fiber;
(d) cooling the fibers; and
(e) collecting the cooled fibers.

4,153,440

TREATMENT OF METALLURGICAL SLAG

Edouard Legille, and Paul Metz, both of Luxembourg, Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Apr. 6, 1978, Ser. No. 893,973
Claims priority, application Luxembourg, Apr. 15, 1977, 77145
Int. Cl.[2] C03B 5/18
U.S. Cl. 65—19 **8 Claims**



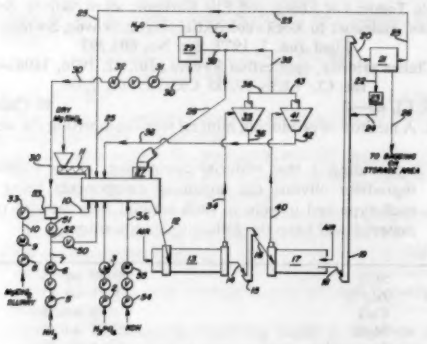
2. An installation for the treatment of metallurgical slag comprising an inclined flow channel provided with means for the injection of water via the base of the channel, the inclined flow channel being adjustable in its angle of inclination, and a disintegration device for the mechanical disintegration of a flow of pyroplastic slag from a blast furnace through the flow channel, the device comprising an interchangable rotary element, the side of which receiving the current of slag being provided with a set of radial ribs.

4,153,441

PROCESS FOR MAKING MAGNESIUM POTASSIUM AMMONIUM PHOSPHATE

William L. Guithues, Memphis, Tenn., and Casimer C. Legal, Jr., Aurora, Colo., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 1, 1978, Ser. No. 930,036
Int. Cl.[2] C05B 7/00, 9/00
U.S. Cl. 71—34 **2 Claims**



1. In the method of making magnesium potassium ammonium phosphate having a water soluble nitrogen of not more than 2% by the steps of

(a) preparing an aqueous reaction slurry by reacting together phosphoric acid of 40–61% P_2O_5, ammonia, urea, potassium hydroxide, and magnesium hydroxide in a reactor-granulating zone, thereby to form granules;
(b) screening the said granules to give granulated product and fines;
(c) recycling the fines from (b) to the granulating zone in (a);

the improvement comprising using, as the phosphoric acid reactant, phosphoric acid which is not furnace grade, but has the following analysis (basis, 60% P_2O_5):

SO_4 (as H_2SO_4) not more than about 3%
Fe_2O_3, not more than about 0.5%
Al_2O_3, not more than about 0.3%.

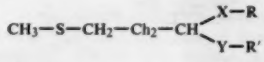
4,153,442

METHIONAL DERIVATIVES AND COMPOSITIONS WITH A GROWTH REGULATING EFFECT UPON PLANTS

Claude Clapot, Oullins; Louis Dumont, Chaponost, and Jean Vial, Tassin la Demi-Lune, all of France, assignors to Philagro S.A., Lyons, France

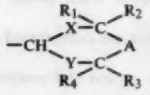
Division of Ser. No. 595,723, Jul. 14, 1975, Pat. No. 4,101,307.
This application Mar. 24, 1978, Ser. No. 889,856
Claims priority, application France, Jul. 15, 1974, 74 25781
Int. Cl.[2] A01N 9/00
U.S. Cl. 71—88 **14 Claims**

1. A growth-regulating composition for plants, comprising (1) an agricultural carrier, (2) a surfactant, and (3) an amount sufficient to regulate the growth of plants of a compound of the formula

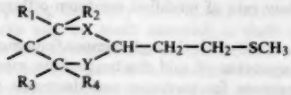


in which
X and Y represent oxygen, and
R and R′ form with

a cycle corresponding to the formula

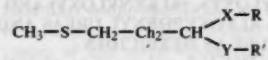


in which
R_1, R_2, R_3 and R_4, which may be the same or different, represent hydrogen, an alkyl radical containing from 1 to 4 carbon atoms and optionally substituted by a halogen, the radicals NO_2, hydroxy and alkoxy containing from 1 to 4 carbon atoms; and
A represents an alkylene chain with 1 to 4 carbon atoms optionally interrupted by an oxygen atom, an optionally halogenated or hydroxylated alkyl group, an acyl group, the hydrocarbon portion of these radicals containing from 1 to 4 carbon atoms, or a cycle

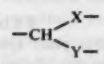


with the proviso that X and Y are both oxygen.

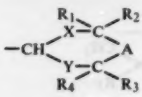
6. A compound corresponding to the formula



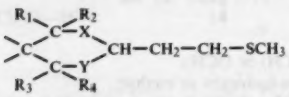
in which
X and Y represent oxygen; and
R and R′ form with



a cycle corresponding to the formula



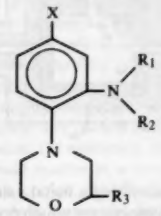
in which
R_1, R_2, R_3 and R_4, which may be the same or different, represent hydrogen, an optionally halogen-substituted alkyl radical containing from 1 to 4 carbon atoms, the radicals NO_2, hydroxy and alkoxy containing from 1 to 4 carbon atoms; and
A represents an alkylene chain containing from 1 to 4 carbon atoms, or the cycle



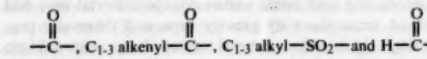
with the proviso that X and Y represent oxygen.

4,153,443
o-AMIDOPHENYLMORPHOLINE COMPOUNDS
Kelvin K. Shen, Fountain Valley, Calif., and Wayne S. Belles, Moscow, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.
Division of Ser. No. 802,606, Jun. 2, 1977, Pat. No. 4,123,251. This application Aug. 3, 1978, Ser. No. 930,781
Int. Cl.[2] C07D *295/14;* A01N *9/16*
U.S. Cl. 71—88 **13 Claims**

1. A compound of the formula



wherein X is selected from lower alkyl, halo, halo-lower alkyl, lower alkylsulfonyl, and halo-lower alkylsulfonyl, R_1 is selected from [C_{1-3} alkyl-SO_2-, and the halo substituted derivatives thereof, R_2 is selected from the group consisting of hydrogen, C_{1-3} alkyl



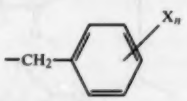
and R_3 is selected from hydrogen and alkyl of 1 to 3 carbon atoms.

7. A herbicidal composition comprising an herbicidally effective amount of a compound according to claim 1, a surfactant and an inert carrier therefor.

4,153,444
HERBICIDAL COMPOSITION
Kazuo Jikihara, Kakegawa; Shinichi Iori, Ogasa; Ichiro Kimura, Shizuoka, and Kyoichi Adachi, Yaizu, all of Japan, assignors to Kumiai Chemical Industry Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 609,725, Sep. 2, 1975, Pat. No. 4,028,091. This application Jan. 17, 1977, Ser. No. 759,673
Claims priority, application Japan, Sep. 2, 1974, 49-100695
The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.
Int. Cl.[2] A01N *9/12*
U.S. Cl. 71—94 **9 Claims**

1. A herbicidal composition, which consists essentially of:
an effective amount of a mixture of a bypyridylium salt selected from the group consisting of the dichloride and dibromide salts of 1,1′-dimethyl-4,4′-bipyridylium and 1,1′-ethylene-2,2′-bipyridylium and a thiocarbamate having the formula:

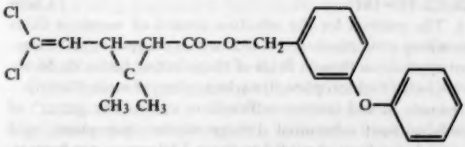
wherein R and R_1 each represent a lower alkyl group or which in combination with each other and with the nitrogen atom can form a hexamethyleneimino ring;
R_2 represents



X represents a halogen atom or a lower alkyl group, and n represents 0, 1 or 2 wherein the ratio of said bipyridylium salt to said thiocarbamate ranges from 1:1–30.

4,153,445
PLANT GROWTH REGULATORS
Ernst Kappel, Dudenhofen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jan. 25, 1978, Ser. No. 872,316
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1977, 2704962
Int. Cl.[2] A01N *9/02, 9/22*
U.S. Cl. 71—94 **2 Claims**

1. A plant growth regulator comprising a composition of (a) a substituted heterocyclic N,N-dimethylammonium halide salt selected from the group consisting of the N,N-dimethylmorpholinium salt and the N-N-dimethylpiperidinium salt, and (b) a compound selected from the group of substituted carboxylates of 3-phenoxybenzyl of the formulae



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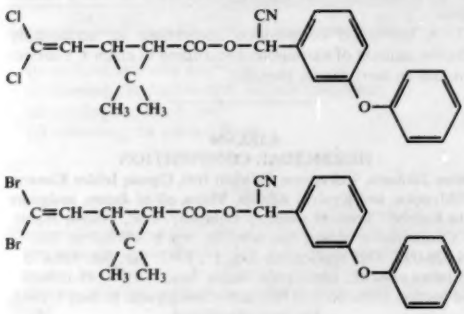


wherein the ratio of (a) to (b) is from 1:10 to 20:1.

4,153,446

HERBICIDAL N-(HALOACETYL)-N'-METHYLENEPYRROLIDONYL)-2-CYCLOALKOXYANILINES

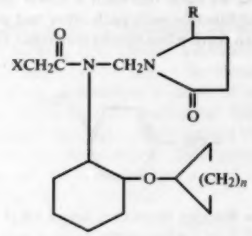
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Sep. 15, 1978, Ser. No. 942,644

Int. Cl.[2] C07D 207/26; A01N 9/22

U.S. Cl. 71—95 **9 Claims**

1. Herbicidal compounds having the formula:



where

n=0-3,

R is hydrogen or alkyl of 1-3 carbon atoms, and,

X is chloro or bromo.

9. A herbicidal composition consisting essentially of a compound of the formula according to claim 1, and an inert carrier therefor.

4,153,447

HERBICIDAL METHYLPHENYL CARBAMATES

Gerhard Boroschewski, Berlin, and Friedrich Arndt, Aich, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Division of Ser. No. 241,801, Apr. 6, 1972, Pat. No. 3,869,504. This application Oct. 29, 1974, Ser. No. 518,858

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1971, 2121957

Int. Cl.[2] A01N 9/20

U.S. Cl. 71—111 **1 Claim**

1. The method for the selective control of weeds in fields containing crop plants and weeds which comprises post emergent application to such fields of the selective herbicide Methyl-N-(3-(N'(3'-chlorophenyl)-carbamoyloxy)4-methylhenyl)-carbamate in and amount sufficient to control the growth of weeds without substantial damage to the crop plants, said amount being from about 0.3 to about 3 kilograms per hectare.

4,153,448

NOVEL (ALKENYLOXY)-, (ALKYNYLOXY) AND (CYANOALKOXY) ALKOXYPHENYL UREAS AND THEIR USE AS HERBICIDES

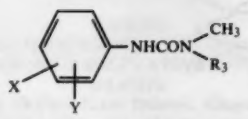
Barrington Cross, Rocky Hill, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 584,543, Jun. 6, 1975, Pat. No. 4,046,808, which is a division of Ser. No. 283,603, Aug. 24, 1972, abandoned. This application May 16, 1977, Ser. No. 797,089

Int. Cl.[2] A01N 9/20

U.S. Cl. 71—120 **8 Claims**

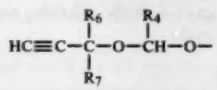
1. A method for the control of undesirable plant species comprising, applying to the undesirable plants or soil containing seeds thereof, a herbicidally effective amount of a compound having the formula:



wherein

X is hydrogen, chlorine or nitro;

Y is



R_3 is hydrogen, CH_3 or OCH_3;

R_4, R_6 and R_7 are hydrogen or methyl;

with the proviso that X and Y are respectively attached to the carbons in the ring which are meta- and para- to the carbon attached to the nitrogen or they are respectively para- and meta- to the ring carbon attached to the nitrogen and when X is para it is hydrogen only.

4,153,449

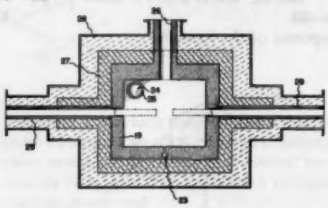
VAPOR NUCLEATION METHOD

Herbert Greenewald, Jr., 4296 Braunton Rd., Columbus, Ohio 43220

Division of Ser. No. 653,158, Jan. 28, 1976, Pat. No. 4,080,509. This application Jan. 26, 1978, Ser. No. 872,423

Int. Cl.[2] C21C 5/52

U.S. Cl. 75—11 **4 Claims**



1. In a method of processing a metal values charge material in a furnace shell at a temperature which produces vapors from the group comprised of metal vapors and metal oxide vapors, the steps of:

(a) developing an ionized atmosphere within said furnace shell to a temperature producing vapors from the group comprised of metal vapors and metal oxide vapors of said metal values charge;

(b) introducing said metal values charge material into said ionized atmosphere by gravity flow and thermally processing said introduced metal values charge material into a metal values phase and a non-metallic gaseous phase;

(c) flowing said non-metallic gaseous phase through a nucleation filter within said furnace shell that separates vapors from the group consisting of metal vapors and metal oxide vapors of said metal values charge material from said non-metallic gaseous phase for return to said ionized atmosphere;

(d) collecting said metal values phase beneath said ionized atmosphere for subsequent removal from within said furnace shell; and

(e) emitting portions of said non-metallic gaseous phase passed through said nucleation filter from within said furnace shell in a condition free of metal and metal oxide constituents from said metal values charge material;

said nucleation filter being porous, non-graphitic carbon.

4,153,450

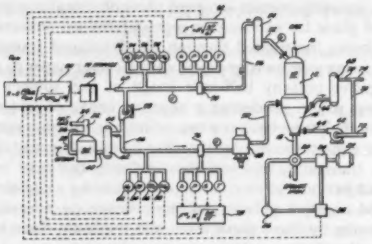
METHOD AND APPARATUS FOR MEASURING AND CONTROLLING THE PERCENTAGE REDUCTION OF ORE IN A MOVING BED GASEOUS REDUCTION REACTOR

Patrick W. MacKay; Enrique M. Vera, and Ramón de la Peña, all of Monterrey, Mexico, assignors to Grupo Industrial Alfa, S.A., Mexico

Division of Ser. No. 646,496, Jan. 5, 1976, Pat. No. 4,099,962. This application May 23, 1978, Ser. No. 908,764

Int. Cl.[2] C22B *1/10*

U.S. Cl. 75—26 **2 Claims**



1. A process for producing sponge metal by the gaseous reduction of oxidic metal ore in a vertical moving bed reactor, said process comprising charging ore to the reactor, passing a reducing gas largely composed of carbon monoxide and hydrogen and which may also contain methane and carbon dioxide through the bed of ore in said reactor, cooling the effluent gas from said reactor to remove water therefrom and determining the extent to which reduction of said ore occurs in said reactor by (1) measuring the flow of reducing gas fed to said reactor at a first location before said gas enters said reactor, (2) effectively determining the concentrations of carbon monoxide, hydrogen, methane and carbon dioxide in said reducing gas at said first location, (3) measuring the flow of the effluent reducing gas from said reactor at a second location after the effluent gas has been cooled, (4) effectively determining the concentration of carbon monoxide, hydrogen, methane and carbon dioxide in said effluent gas at said second location, (5) incorporating said concentrations and flows in a combined hydrogen and oxygen balance to obtain a first value indicative of the rate at which oxygen is removed from said ore, (6) measuring the rate at which metal-bearing material is processed through said reactor to obtain a second value indicative of the rate at which oxygen is introduced into said reactor with said ore, and (7) comparing said first and second values to obtain a third value indicative of the percentage reduction of the sponge metal leaving said reactor.

4,153,451

LEAD RECOVERY AND WASTE DISPOSAL PROCESS

Lloyd T. Crasto; Robert H. Jones, and John C. Klock, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed May 1, 1978, Ser. No. 901,453

Int. Cl.[2] C22B *13/00*

U.S. Cl. 75—77 **8 Claims**

1. A process for the recovery of lead from lead by-product materials which contain from 45 to about 75 weight percent lead in the form of lead compounds which are of the character of slag produced in a reverberatory lead recovery furnace, comprising the steps of

(a) charging said lead by-product materials to a rotary furnace;

(b) drying and melting the lead by-product materials at 330° to about 650° C. until any residual moisture is driven off;

(c) adding to the molten furnace charge about 0.05 to about 0.25 pounds per pound of said charge of an active alkali metal mixture;

(d) smelting the furnace charge in the presence of said alkali metal mixture for a time sufficient to form a separate metallic lead phase and a residue; and

(e) removing the metallic lead from the furnace.

4,153,452

RECOVERY OF METALS FROM BIMETALLIC SALT COMPLEXES

Donald A. Keyworth, Houston, and Jerome R. Sudduth, Pasadena, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jul. 11, 1978, Ser. No. 923,761

Int. Cl.[2] C01G *7/34*; C22B *15/12, 11/04*

U.S. Cl. 75—101 BE **10 Claims**

1. The process for the recovery of metals from waste materials that comprise a bimetallic salt complex component selected from the group consisting of complexes having the formula $M_IM_{II}X_n$.Aromatic, complexes having the formula $M_IM_{II}X_{n-}.M_IOX$.Aromatic, and mixtures thereof, wherein M_I is a Group I-B metal, M_{II} is a Group III-A metal, X is halogen, n is the sum of the valences of M_I and M_{II} and Aromatic is a monocyclic aromatic hydrocarbon or halogenated aromatic hydrocarbon having 6 to 12 carbon atoms, and an organic component selected from the group consisting of monocyclic aromatic hydrocarbons having 6 to 12 carbon atoms, halogenated aromatic hydrocarbons having 6 to 12 carbon atoms, alkylated aromatic hydrocarbons, olefin oligomers, tars, and mixtures thereof that comprises the steps of

(a) contacting said waste material with an amount of dilute aqueous hydrochloric acid sufficient to form a hydrolysis mixture having a pH in the range of 1.8–2.3;

(b) allowing the hydrolysis mixture to separate into an upper organic phase and a lower aqueous phase that is an aqueous solution of M_I chloride and M_{II} chloride;

(c) separating said organic phase from said aqueous solution;

(d) adding to the aqueous solution an amount of a metal that is stoichiometrically equivalent to the amount of M_I chloride in the solution, said metal being selected from the group consisting of aluminum, iron, and magnesium, thereby causing M_I to precipitate;

(e) separating precipitated M_I from the aqueous M_{II} chloride solution;

(f) adding to the aqueous M_{II} chloride solution sufficient alkali metal hydroxide to bring it to a pH in the range of 5 to 7, thereby causing M_{II} hydroxide to precipitate from the aqueous alkali metal chloride solution; and

(g) recovering precipitated M_{II} hydroxide from said solution.

4,153,453

COMPOSITE ELECTRODEPOSITS AND ALLOYS

Anthony C. Hart, Sedgley, and William R. Wearmouth, Halesowen, both of England, assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 662,938, Mar. 1, 1976, abandoned. This application Sep. 8, 1977, Ser. No. 831,471

Int. Cl.[2] C25D *3/56*; C22C *19/03, 19/05, 38/00*

U.S. Cl. 75—123 J 4 Claims

1. A process for producing an alloy comprising: coelectrodepositing a matrix of at least one metal selected from the group consisting of nickel, nickel-cobalt alloys containing less than 50% by weight cobalt, nickel-iron alloys, nickel-molybdenum alloys and iron, with reactive particles incorporating metal in chemically combined state, said particles being compounds of at least one reactive element selected from the group consisting of carbon, nitrogen, and boron, and of at least one metallic element selected from the group consisting of chromium, molybdenum, and tungsten, thereby providing a composite electrodeposit; and heating said composite electrodeposit to temperatures of from about 1000° C. to about 1400° C. in a reducing gas atmosphere capable of taking up carbon, nitrogen or boron from said composite electrodeposit for a time sufficient to release at least 50% of said metallic element of said particles from its chemically combined state into said matrix thereby forming said alloy while transferring an equivalent amount of said reactive element to said atmosphere.

4. An alloy produced from an electrodeposit containing: a matrix of at least one metal selected from the group consisting of nickel, nickel-cobalt alloys containing less than 50% by weight cobalt, nickel-iron alloys, nickel-molybdenum alloys and iron; and reactive particles incorporating metal in chemically combined state and being compounds of at least one reactive element selected from the group consisting of carbon, nitrogen, and boron and of at least one metallic element selected from the group consisting of chromium, molybdenum, and tungsten, said alloy being formed by heating said electrodeposit in a reducing gas atmosphere capable of taking up carbon, nitrogen or boron from said reactive particles to temperatures of from about 1000° C. to about 1400° C. for at least 24 hours whereby at least 50% of the metal in said particles is released from its chemically combined state into said matrix.

4,153,454

STEEL MATERIALS HAVING AN EXCELLENT HYDROGEN INDUCED CRACKING RESISTANCE

Toshihiko Emi; Osamu Haida, both of Chiba; Shinobu Okano; Shuji Watanabe, both of Kurashiki; Akitoshi Fujiwara, Togane; Toshiaki Shiraishi, Chiba; Hiroshi Ooi, Kurashiki; Toshio Iwasaki, Kurashiki, and Noboru Okamoto, Kurashiki, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Dec. 23, 1977, Ser. No. 863,601

Claims priority, application Japan, Aug. 12, 1977, 52-95992

Int. Cl.[2] C22C *38/06*

U.S. Cl. 75—124 7 Claims

1. In a steel having excellent hydrogen induced cracking resistance, which consists essentially of 0.05 to 0.20% of C, 0.01 to 0.50% of Si, 0.60 to 2.00% of Mn and 0.01 to 0.10% of Al and which is used under atmosphere containing hydrogen sulfide, the improvement wherein said steel contains S in an amount less than 0.0020% and Ca in an amount of 0.0020% to less than 0.0050%, the remainder being Fe inclusive inevitable impurities.

4,153,455

HIGH TEMPERATURE NICKEL-BASE ALLOYS

Herbert L. Eiselstein, Huntington, and Allen C. Lingenfelter, Ona, both of W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Filed May 19, 1977, Ser. No. 798,651

Int. Cl.[2] C22C *19/05*

U.S. Cl. 75—171 6 Claims

1. A nickel-base alloy adapted for use in high temperature gas cooled reactor and having a high resistance to creep at elevated temperatures, the alloy consisting essentially of about 22% to 28% chromium, about 3% to 9% tungsten, titanium in an amount sufficient to enhance the malleability of the alloy and up to about 1%, up to 0.1% carbon, up to about 0.15% aluminum, and the balance essentially nickel, said alloy being substantially free of cobalt for HTGR use.

4,153,456

METHOD OF PRODUCING HIGH QUALITY PHOTOGRAPHS ON MICROFICHE

William C. Farmer, Metamora, Ill., assignor to High Point, Incorporated, Peoria, Ill.

Filed Aug. 22, 1977, Ser. No. 826,528

Int. Cl.[2] G03C *5/04*; G03F *5/00*; G03C *1/58*

U.S. Cl. 96—27 R 4 Claims

4. In a method for producing duplicate diazo transparencies having a positive polarity image of a real world subject thereon, the steps of exposing transparent photosensitive materialto light transmitted from said subject anddeveloping the same to form a continuous tone negative image thereof, transmitting light through the developed transparency and focusing the same to form an image of said negative image at an image plane, locating contact screened photochemical transfer paper in said plane for exposure to a predetermined amount of said light being transmitted through the developed transparency, processsing said transfer paper with receiver paper to produce a negative polarity half-tone image of said subject on said receiver paper, producing a negative image of said negative polarity half-tone image on microfilm, and utilizing said microfilm as a master to produce by diazo duplication said duplicate diazo transparencies therefrom. polarity half-tone image of said subject on said receiver paper, producing a negative image of said negative polarity half-tone image on microfilm, and producing by diazo duplication said duplicate diazo transparencies therefrom.

4,153,457

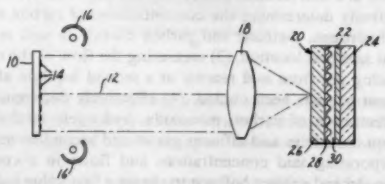
HIGH RESOLUTION HALFTONE MICROIMAGES AND METHOD THEREFOR

Truman F. Kellie, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 16, 1978, Ser. No. 869,619

Int. Cl.[2] G03C *5/04, 11/00*

U.S. Cl. 96—27 H 24 Claims



1. A method of forming a halftone microimage comprising the steps of:

(a) providing an ultra-high resolution gradient density screen by exposing a photosensitive medium to two mutually coherent beams of radiation directed onto said medium at different angles to provide an interference fringe

field pattern in said medium having a spatial frequency defined by the expression

$$S = \frac{2 \sin \theta/2 \cos \phi}{\lambda}$$

where S is the spatial frequency, θ is the angle between the two beams impinging onto the medium, ϕ is the angle between a line normal to the surface of the medium and a line bisecting the angle θ, and λ is the wavelength of said coherent beams of radiation, such that said interference fringe field pattern has a spatial frequency between 40 and 250 line pairs per millimeter, and processing said medium to transform the medium into said gradient density screen in which said interference fringe field pattern is permanently recorded as an image over which the optical transparency varies as a function of the exposure distribution,

(b) directing a source of actinic radiation through said gradient density screen and onto a second photosensitive medium, and directing a source of actinic radiation onto a continuous tone original image and thence through reduction lenses and onto said second medium to form in said second medium a halftone microimage replica of said original image modulated by the interference fringe field pattern, and

(c) processing said second medium to provide a permanent halftone microimage of said continuous tone original image having a high contrast image of said gradient density screen therein, which microimage may be projected in enlarged form as an apparent continuous tone image.

4,153,458

PHOTOGRAPHIC BINDER MIXTURE OF THREE POLYMERS

Shigeru Iguchi; Tamotu Iwata, and Tetsuo Yano, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Division of Ser. No. 678,715, Apr. 20, 1976, Pat. No. 4,119,463.
This application Nov. 1, 1977, Ser. No. 847,598
Claims priority, application Japan, Apr. 24, 1975, 50-50078
Int. Cl.[2] G03C *1/76, 1/78;* C03C *1/72*
U.S. Cl. 96—67 **15 Claims**

1. A photographic binder prepared by heating an isobutylene-maleic anhydride copolymer, a styrene-maleic anhydride copolymer and polyvinyl alcohol in the form of aqueous solution wherein the ranges of amounts of the isobutylene-maleic anhydride copolymer, styrene-maleic anhydride copolymer and polyvinyl alcohol are 1–45% by weight, 5–49% by weight and 50–94% by weight, respectively.

4,153,459

HYBRID COLOR PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR DEVELOPING SAME

Dan Neuberger, and Jon T. Staples, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

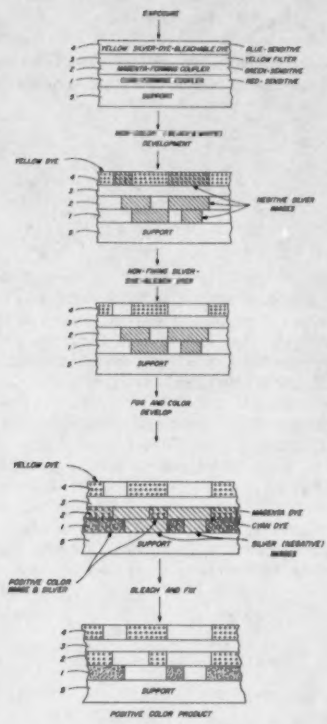
Continuation of Ser. No. 416,706, Nov. 16, 1973, abandoned.
This application Dec. 1, 1975, Ser. No. 636,395
Int. Cl.[2] G03C *3/00, 1/76, 1/84, 7/04*
U.S. Cl. 96—73 **12 Claims**

1. In a photosensitive multilayer color photographic element which comprises at least two photosensitive silver halide containing emulsion coatings on a photographic support; said coatings being further defined as:

(a) a first coated portion of said element which contains a first layer which is spectrally sensitive to the blue visible region of the spectrum and contains, incorporated therein, at least one yellow dye-forming coupler material capable of forming a non-bleachable yellow dye upon reaction of said coupler material with oxidized organic amino color developer; and

(b) a second coated portion of said element which contains a second layer which is spectrally sensitized to the green visible region of the spectrum and contains, incorporated therein, at least one color-forming coupler material capable of forming a magenta dye upon reaction of said coupler material with oxidized organic amino color developer, and said second coated portion being closer to said photographic support than said first coated portion;

the improvement wherein said first coated portion of said element contains a shifted silver-dye-bleachable yellow dye in



an amount sufficient to provide greater than half of the yellow dye density formed in the element; said shifted silver-dye-bleachable yellow dye being capable of being destroyed as a function of the metallic silver content of said first layer when said element is contacted with a silver-dye-bleach solution, and having an absorption maximum in the ultraviolet region of the spectrum at an emulsion pH of about 6 and an absorption maximum in the blue region of the spectrum at a pH of 10.

4,153,460

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Toshifumi Iijima, Kokubunji; Tadahiko Obikawa, and Motoaki Tanaka, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd, Tokyo, Japan

Filed Feb. 7, 1978, Ser. No. 875,885
Claims priority, application Japan, Feb. 10, 1977, 52-13599
Int. Cl.[2] G03C *1/76, 1/06*
U.S. Cl. 96—74 **15 Claims**

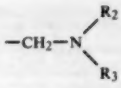
1. A light-sensitive silver halide color photographic material which comprises a support and (A) a red-sensitive silver halide emulsion layer, (B) a non-light-sensitive layer adjacent to the red-sensitive silver halide emulsion layer, and (C) a light-sensitive silver halide emulsion layer adjacent to the non-light-sensi-

tive layer, coated on the support in this order, the non-light-sensitive layer comprising substantially non-light-sensitive silver halide grains, the red-sensitive silver-halide emulsion layer comprising (D) a DIR compound which releases a development inhibiting compound on the reaction with an oxidation product of an aromatic primary amine developing agent and (E) a 2-equivalent cyan coupler which is substantially colorless and represented by the general formula (I) or (II):

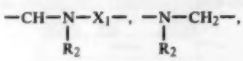
$$C_p - Y \quad (I)$$

$$C_p - X - C_p \quad (II)$$

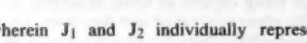
wherein C_p represents a phenol cyan coupler residue, an α-naphthol cyan coupler residue or a pyrazoloquinozolone cyan coupler residue; Y represents —OR_1 or



(wherein R_1, R_2 and R_3 individually represent an alkyl group, an alkenyl group, an aryl group, an acyl group, a carbamoyl group, a sulfamoyl group, a sulfonyl group, morpholino, piperazyl, imidazolyl, furyl, imidazolinyl, tetrazolyl, pyrimidinyl, pyrrolyl, pyrrolidinyl, thiazinyl, thiazolinyl, thiazolyl, and thienyl or R_2 and R_3 can cooperatively form a member selected from imidazolidinyl, imidazolinyl, imidazolyl, morpholino, oxazolidinyl, piperidino, pyrazinyl, pyrazolidinyl, pyrazolinyl, pyrazolyl, pyrrolyl, pyrrolidinyl, pyrrolinyl, tetrazolyl, thiazolidinyl, triazolidinyl and triazolyl or —$NHCOR_4$ or —$NHSO_2R_4$ (wherein R_4 represents an aliphatic hydrocarbon residue, an alicyclic hydrocarbon residue, an aromatic hydrocarbon residue, morpholino, piperazyl, imidazolyl, furyl, imidazolidinyl, tetrazolyl, pyrimidinyl, pyrrolyl, pyrrolidinyl, thiazinyl, thiazolinyl, thiazolyl and thienyl and X represents —O—X_1—O—,



—$NHCO-X_1-CONH$— or —$NHSO_2-X_1-SO_2-NH$— (wherein X_1 represents



wherein J_1 and J_2 individually represent —S—, —O—, —CO—,

—SO—, —SO_2—, —NHCO—, —CONH—, —$NHSO_2$— or —SO_2NH—, J_3 represents —SO_2—, —CONH— or —CO—; X_2 and X_3 individually represent an alkylene group, an arylene group, an aralkylene group, an arylenealkylene group, or a 2,4-pyrimidine residue, x, y and z individually represent 0 or 1 and w represents 0 or 1, provided that when X_1 is attached to oxygen, w represents 1.

4,153,461

LAYER SUPPORT FOR LIGHT-SENSITIVE MATERIAL ADAPTED TO BE CONVERTED INTO A PLANOGRAPHIC PRINTING PLATE

Günter Berghäuser, Wiesbaden-Schierstein, and Fritz Uhlig, Wiesbaden-Biebrich, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 780,597, Dec. 2, 1968, abandoned. This application Nov. 3, 1972, Ser. No. 303,515

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1967, 1621478

Int. Cl.[2] G03C *1/52*; G03F *7/02*; G03C *1/64, 1/94*

U.S. Cl. 96—75 **3 Claims**

1. An aluminum base, for use in the manufacture of presensitized printing plates, having a surface which is the reaction product of polyvinyl phosphonic acid with an anodically produced aluminum oxide layer having a thickness in the range of about 0.0002 to 0.01 mm.

4,153,462

METHOD OF MAKING SILVER HALIDE EMULSIONS

Arthur M. Gerber, Boston, and Vivian K. Walworth, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 311,690, Dec. 4, 1972, abandoned. This application Aug. 14, 1975, Ser. No. 604,889

Int. Cl.[2] G03C *1/02*

U.S. Cl. 96—94 R **17 Claims**

1. A method of forming silver halide crystals which comprises crystallizing silver halide crystals from a solution of an inorganic water-soluble complex of silver halide complexed with excess halide, by disposing said solution in a dilution medium, wherein said dilution medium includes an agent for modulating the crystallization of said silver halide crystals and wherein said crystals are insoluble in said dilution medium.

4,153,463

PHOTOTHERMOGRAPHIC EMULSIONS CONTAINING MAGENTA ACUTANCE DYES

Bernard A. Lea, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

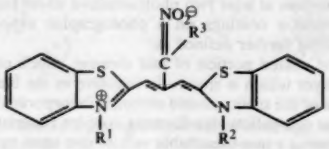
Filed Apr. 14, 1978, Ser. No. 896,439

Claims priority, application United Kingdom, Apr. 21, 1977, 16677/77

Int. Cl.[2] G03C *1/02*

U.S. Cl. 96—114.1 **10 Claims**

1. A photothermographic emulsion comprising a light-insensitive organic silver salt which upon reduction produces a visible change, silver halide in an amount sufficient so that when struck by light it can catalyse the reduction of said organic silver salt, and a reducing agent for silver ions, said emulsion characterized by containing a magenta acutance dye of the formula:



in which R^1 and R^2 independently represent an alkyl group, and R^3 represent a hydrogen atom or an alkyl group, an aralkyl group, an aryl group or an electronegative group.

4,153,464

PREVENTION OF WATER STAINING OF ALUMINUM

Robert J. Sturwold; Walter E. Utz, both of Cincinnati, Ohio; Nicholas Christ, Richmond, Va.; William R. Ford, Jr., Richmond, Va., and George P. Koch, Richmond, Va., assignors to Emery Industries, Inc., Cincinnati, Ohio and Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 832,258, Sep. 12, 1977, Pat. No. 4,122,217, which is a continuation of Ser. No. 602,816, Aug. 7, 1975, abandoned. This application Jul. 24, 1978, Ser. No. 927,424

Int. Cl.[2] C23F *11/12;* C10M *1/24*

U.S. Cl. 106—14.27 10 Claims

1. A protective oil useful for the prevention of water staining of aluminous metal sheet consisting essentially of a major amount of an aliphatic or aromatic hydrocarbon oil having a 100° C. viscosity of 20 to 100 SUS and a minor amount but at least 0.1 weight percent of a protective composition having a hydroxyl value greater than 15 and derived from (a) an aliphatic or cycloaliphatic polybasic acid containing from 18 to 72 carbon atoms and 2 to 4 carboxyl groups and (b) a partial ester of a polyol derived from a C_{12}–C_{22} aliphatic monocarboxylic acid and a polyol selected from the group consisting of glycerol, diglycerol, triglycerol, tetraglycerol, trimethylolpropane, pentaerythritol, dipentaerythritol, tripentaerythritol and tetrapentaerythritol, said polyol having no more than 70% of the available hydroxyl groups esterified; the weight ratio of (a) to (b) ranging from 20:1 to 1:4.

4,153,465

$CAZN_2(PO_4)_2.2H_2O$ ANTICORROSION PIGMENT

Franz Hund, and Peter Kresse, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 28, 1977, Ser. No. 855,482

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656779

Int. Cl.[2] C09D *5/08*

U.S. Cl. 106—14.25 12 Claims

1. A process for the production of $CaZn_2(PO_4)_2.2H_2O$ crystallizing in the Scholzite lattice which comprises heating at a temperature up to about 175° C. for up to about 10 hours an aqueous suspension of $CaZn_2(PO_4)_2$, filtering off the $CaZn_2(PO_4)_2.2H_2O$ and drying it.

4,153,466

COMPOSITIONS COMPRISING PHOSPHATE SALTS OF POLY-2-OXAZOLINE AND FIRE RETARDANT FORMULATIONS

William L. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 25, 1977, Ser. No. 845,189

Int. Cl.[2] C08L *79/02;* C09D *5/18*

U.S. Cl. 106—15.05 28 Claims

1. A composition comprising a phosphorylated poly-2-oxazoline having a weight average molecular weight of at least about 1000, the poly-2-oxazoline being about 25 to 90 percent phosphorylated, and an inorganic salt fire retardant formulation.

13. A method of imparting fire retardancy to a cellulosic substrate, the method comprising contacting the substrate with a fire retardant amount of a solution of the composition of claim 1.

4,153,467

METHOD OF INK JET PRINTING

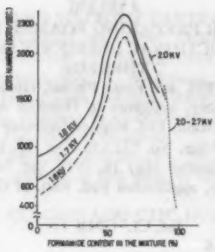
Hirofumi Yano, Kamakura; Noriaki Okamura, and Tsunehiko Toyoda, both of Yokohama, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 563,337, Mar. 31, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,600

Claims priority, application Japan, Sep. 3, 1974, 49-101026

Int. Cl.[2] C09D *11/02, 11/06, 11/10;* G01D *15/18*

U.S. Cl. 106—20 7 Claims



1. In a method of ink jet printing which comprises injecting ink through a fine nozzle and electrostatically deflecting the resulting ink particles to print a symbol which corresponds to a predetermined matrix, the improvement wherein said ink is a non-aqueous ink which comprises a coloring agent and a mixture of formamide and an C_1–C_8 aliphatic monohydric monovalent alcohol, wherein the weight ratio of formamide to aliphatic alcohol is 40–80 to 60–20.

4,153,468

ISOCYANATED POLYVALENT METAL SALTS OF NATURAL WAXES

Joseph O. Bienvenu, Longview, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 534,682, Dec. 20, 1974, Pat. No. 4,004,932. This application Dec. 2, 1976, Ser. No. 746,889

The portion of the term of this patent subsequent to Jan. 25, 1994, has been disclaimed.

Int. Cl.[2] C09D *11/12*

U.S. Cl. 106—31 12 Claims

1. An isocyanated polyvalent metal treated natural wax composition, said metal treatment being the conversion of acid components of said natural wax to the corresponding polyvalent metal salts and said isocyanated composition being the product obtained by reacting said salts with an organic polyisocyanate.

4,153,469

MONOCRYSTALS BASED ON STABILIZED ZIRCONIUM OR HAFNIUM DIOXIDE AND METHOD OF PRODUCTION THEREOF

Vladimir I. Alexandrov, ulitsa Ostrovityanova 31, kv. 291; Vyacheslav V. Osiko, ulitsa Vavilova 48, kv. 63; Vladimir M. Tatarinsev, Leninsky prospekt 45, kv. 112, and Viktor T. Udovenchik, ulitsa Bolshaya 135, all of Moscow, U.S.S.R.

Continuation of Ser. No. 782,445, Mar. 29, 1977, abandoned, which is a continuation of Ser. No. 391,055, Dec. 27, 1972, abandoned. This application Jan. 27, 1978, Ser. No. 873,063

Int. Cl.[2] C04B *35/48;* B01J *17/00;* C01F *17/00;* C01G *27/02*

U.S. Cl. 106—42 12 Claims

3. A method of producing transparent, cubic monocrystals based on a dioxide of a metal selected from the group consisting of zirconium and hafnium, said dioxide being stabilized with yttrium oxide; comprising the steps of preparing a charge of said dioxide of a metal selected from the group consisting of zirconium and hafnium, and yttrium oxide in a molar ratio of said metal dioxide to yttrium oxide from 70–90:30–10 respec-

tively; heating said charge to a temperature sufficient to effect melting thereof; and growing the monocrystals from the melt obtained in the open air by withdrawing said charge from the melting zone at a rate of from 2 to 30 mm per hour.

11. Transparent, cubic monocrystals produced in accordance with the method as claimed in claim 3.

4,153,470

PROCESS FOR PREPARING FOAMED GYPSUM AND CONSTRUCTIONAL ELEMENTS COMPOSED THEREOF

Dieter Stahl, Kriftel, and Ernst Puchel, Hofheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 732,133, Oct. 13, 1976, abandoned. This application May 18, 1978, Ser. No. 907,360

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1975, 2546181

Int. Cl.[2] C04B *11/14*

U.S. Cl. 106—116 **4 Claims**

1. A process for the manufacture of foamed gypsum and structural elements composed thereof which comprises mixing gypsum with water in the presence of an additive for plasticizing the gypsum to produce a plaster paste and for adjusting the paste setting time, said additive being a melamine resin, incorporating by dispersion into the gypsum-water mixture, from 1 to 30 percent calculated on the weight of gypsum, of a preadduct composed of a mixture of a reactant of an isocyanate with a hydroxy or amino group containing polyester or polyether and excess isocyanate and foaming the gypsum-water mixture before it sets.

4,153,471

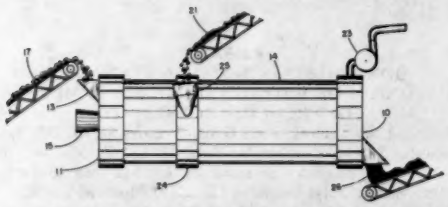
PROCESS FOR TREATING EXHAUST GASEOUS MIXTURES FROM DIRECTLY EXPOSING ASPHALT-AGGREGATE COMPOSITIONS TO HOT GASES

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Filed Dec. 27, 1976, Ser. No. 754,314

Int. Cl.[2] C08L *95/00*; B01D *53/34*

U.S. Cl. 106—281 R **5 Claims**



1. A process for treating asphalt-aggregate compositions comprising directly exposing the composition in a heating chamber to hot gases of hydrocarbon combustion to form a gaseous exhaust mixture comprising carbon dioxide, water vapor, hydrocarbon volatiles from said asphalt, and mineral particulate matter from said aggregate, directing the gaseous mixture through a restricted nozzle orifice into a chamber, and simultaneously directing a flame and entraining oxygen containing gas to support combustion into said gaseous mixture as it flows from said nozzle.

4,153,472

PROCESS FOR PREPARING A RED PIGMENTARY IRON OXIDE

Tullio Pellizzon, Paderno Dugnano; Luigi Piccolo, and Antonio Paolinelli, both of Milan, all of Italy, assignors to Euteco S.p.A., Sassari, Italy

Filed Dec. 13, 1977, Ser. No. 860,104

Claims priority, application Italy, Jan. 11, 1977, 19152 A/77

Int. Cl.[2] C09C *1/24*

U.S. Cl. 106—304 **10 Claims**

1. A process for preparing a red pigmentary Fe_2O_3 iron oxide of spherical form, with an average sphere size of the order of 0.1–0.4 microns, starting from ferrous sulphate, an inorganic base and an organic aromatic nitro-derivative, comprising:

mixing an aqueous solution of ferrous sulphate with an organic aromatic nitro-derivative and while operating at a temperature between 85° C. and the boiling point of the reaction mixture at atmospheric pressure, feeding into the mixture aqueous alkali metal hydroxide up to a maximum of approximately 2 moles for each mole of ferrous sulphate, the ratio of moles of alkali metal hydroxide to equivalents of the aromatic nitro-derivative being equal to or less than about 12:1, said feed of aqueous alkali metal hydroxide being gradual to maintain in the reaction medium a pH of less than 8, whereby a suspension of the Fe_2O_3 iron oxide pigment with a solids content, evaluated as Fe_2O_3, of not greater than 110g/liter, and an aromatic amine are formed, the pigmentary iron oxide and the aromatic amine then being recovered from the reaction products so obtained.

4,153,473

METHOD OF CONTROLLING AND REMOVING ICE AND SNOW FROM ROADS AND BRIDGES

Arnold M. Rosenberg, Potomac, and James M. Gaidis, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 700,343, Jun. 28, 1976, Pat. No. 4,092,109. This application Mar. 1, 1978, Ser. No. 882,461

Int. Cl.[2] C09K *3/18*

U.S. Cl. 134—5 **3 Claims**

1. The method of control and/or removal of snow and ice on highways, bridges, and the like comprising applying calcium nitrite to such areas at the rate of 1–50 tons per two-lane mile.

4,153,474

SOLAR ENERGY COLLECTOR

Dietrich Rex, Brunswick, Fed. Rep. of Germany, assignor to Erno Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,120

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557296

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 PC **10 Claims**

1. Collector of solar energy for generating electrical energy without requiring convective cooling, comprising:

a plurality of concave mirrors each having a concave reflecting surface and a conversely curved rear surface, not being in heat exchange relation with a cooling fluid, said mirrors arranged side by side so that a portion of the

convex rear surface of a first mirror of the plurality is adjacent a focal area of a second mirror of the plurality next to the first mirror; and

a strip-shaped photoelectric solar energy cell affixed to said surface portion of said first mirror receiving radiation as focussed by the second mirror for directly generating electrical energy, a flat side of the cell being in thermal conductive relation with said first mirror said mirror having a thermal emissive surface so that the first mirror serves as radiation vane to dissipate thermal energy exclusively by radiation.

4,153,475

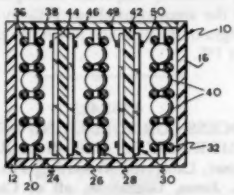
THREE DIMENSIONAL SOLAR PANEL ASSEMBLY

Ross B. Hider, 2752 29th St., and Ross J. Hider, 4062 Cherokee St., both of San Diego, Calif. 92104

Filed May 18, 1978, Ser. No. 907,114

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 PC **5 Claims**



1. A three dimensional solar panel assembly, comprising:

an enclosure which is at least partially transparent to light, said enclosure containing at least a pair of elongated solar cell panels in closely spaced, side-by-side parallel relation;

each of said solar cell panels having side edges and substantially flat side surfaces between the side edges;

and light directing means positioned on each side of each of the solar cell panels for receiving light directed primarily at said side edges and redirecting the received light to the side surfaces of the solar cell panels;

said light directing means comprising a plurality of light transparent balls held together in a light transparent panel structure.

4,153,476

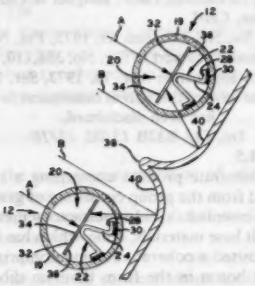
DOUBLE-SIDED SOLAR CELL PACKAGE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Benjamin Shelpuk, Evergreen, Colo.

Filed Mar. 29, 1978, Ser. No. 891,243

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 PC **10 Claims**



1. In a solar cell array for terrestrial use, an improved double-sided solar cell package comprising:

A. a photovoltaic cell having a metallized P-contact stripe and an N-contact grid provided at each of the opposite faces thereof;

B. a transparent tubular body forming an enclosure for said cell;

C. a pedestal supporting said cell within the enclosure comprising an electrical conductor connected with the P-contact stripe provided for each face of the cell; and

D. means for directing rays of light to impinge on each face of said cell.

4,153,477

FRICTION STRESSED MACHINE PARTS OF CAST IRON WITH LEDEBURITIC BEARING SURFACE AND METHODS FOR THEIR PRODUCTION

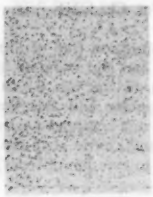
Horst Beyer, Burscheid; Hans J. Neuhäuser, Berg.-Gladbach, Paffrath, and Hans-Jürgen Veutgen, Burscheid, all of Fed. Rep. of Germany, assignors to Goetzewerke Friedrich Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Apr. 28, 1977, Ser. No. 791,890

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618775

Int. Cl.[2] C21D *5/00*; C22C *37/04*

U.S. Cl. 148—1 **14 Claims**



1. In a friction stressed machine part of cast iron which machine part is a sealing strip for a rotary engine, said sealing strip having a ledeburitic-containing bearing surface, the improvement wherein 0.1 to 10 area percent of the ledeburitic-containing bearing surface is predominantly nodular-shaped graphite.

7. A method for producing a friction stressed machine part of cast iron with a ledeburitic-containing bearing surface, wherein 0.1 to 10 area percent of predominantly nodular-shaped graphite is present in the ledeburitic-containing bearing surface, comprising melting the bearing surface of the machine part, ledeburitically quenching the melted bearing surface, and then subjecting the machine part to a tempering treatment by heating the machine part for 15 minutes to two hours to a temperature above 700° C., thereafter quenching to below 500° C., and then reheating for 30 minutes to two hours to a temperature up to 700° C.

4,153,478

PROCESS FOR TREATMENT OF METALLIC SURFACES BY MEANS OF FLUOROPHOSPHATE SALTS

Bernard Parant, Ozoir-La-Ferriere; Louis Cot, Montpellier; William Granier, Clapiers, and Jean-Henri Durand, Montpellier, all of France, assignors to The Diversey Corporation, Chicago, Ill.

Division of Ser. No. 789,658, Apr. 21, 1977. This application Feb. 15, 1978, Ser. No. 877,829

Claims priority, application France, Apr. 21, 1976, 76 11738

Int. Cl.[2] C23F *7/08*

U.S. Cl. 148—6.15 R **14 Claims**

1. A process for the treatment of a steel, aluminum, aluminum alloy, zinc or zinc alloy metal surface for the passivation and preparation thereof prior to painting which comprises containing the metal surface with a chromium-free composition at a pH of 5 to 13 comprising water and at least one fluorophosphate salt, in an amount to effectively passivate the metal

surface, selected from the compounds of the following formulas and hydrates thereof:

(a) $M_2^{I}PO_3F$

(b) $Li\ M^{I}PO_3F$

(c) $Na\ M^{I}PO_3F$

(d) $M^{II}PO_3F$

(e) $M_2^{I}M^{II}(PO_3F)_2$, and

(f) $M_2^{III}(PO_3F)_3$

wherein M^{I} represents Na, K, Rb, Cs and NH_4; M^{II} represents Cd, Mn and Ni and M^{III} represents Cr, Fe and Al.

4,153,479

ACIDIC ZINC PHOSPHATE SOLUTION AND METHOD

Yukihiko Ayano, Hachioji; Kuniji Yashiro, Ayasemachi, and Akira Niizuma, Ichidawa, all of Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Sep. 30, 1977, Ser. No. 838,330

Claims priority, application Japan, Oct. 1, 1976, 51-117123

Int. Cl.[2] C23F *7/08*

U.S. Cl. 148—6.15 Z **7 Claims**

1. An aqueous composition free of nitrate ion, nitrite ion, chlorate ion, chlorate ion and bromate ion consisting essentially of 0.01 to 0.2 wt. % zinc ion, 0.3 to 5 wt. % phosphate ion, wherein the phosphate and zinc ion sources are alkali metal free, and at least one compound selected from the group consisting of tartaric acid, citric acid and their water soluble salts in a weight ratio to zinc ion of from 0.1 to 20.

4,153,480

METHOD FOR FORMING AN ANTICORROSIVE OXIDE LAYER ON STEELS

Erwin Coester; Heinz Krapf, both of Jülich; Martin Pfistermeister, Düren; Bruno Sartor, Pier, and Hans Mohrhauer, Jülich, all of Fed. Rep. of Germany, assignors to Uranit Uran-Isotopentrennungs-Gesellschaft mbH, Jülich, Fed. Rep. of Germany

Filed Nov. 17, 1977, Ser. No. 852,569

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652293

Int. Cl.[2] C23F *7/04*

U.S. Cl. 148—6.35 **12 Claims**

1. In a method for forming an anti-corrosive oxide layer on steel, in which the steel surface is subjected to superheated steam for a period of at least one hour, the improvement comprising heating the steel surface to a temperature of above 180° C. up to 480° C. in a gaseous formic acid atmosphere, and then subjecting the heated steel to a further heating period of 1 to 5 hours in which a temperature between 450° C. and 520° C. is maintained, with superheated steam under flow conditions in which the flow has a Reynolds number of greater than 900.

4,153,481

CYANIDE-FREE CARBURIZING PROCESS AND COMPOSITION

Robert W. Foreman, Bloomfield Hills; Gajen P. Dubal, Sterling Heights, and Charles R. Fox, Livonia, all of Mich., assignors to Park Chemical Company, Detroit, Mich.

Filed Jul. 5, 1977, Ser. No. 812,758

Int. Cl.[2] C21D *1/48*

U.S. Cl. 148—15.5 **4 Claims**

1. A non-cyanide carbon diffusion process for case-hardening ferrous metal parts comprising the steps of:

producing a molten bath consisting essentially of an alkali metal chloride and an alkali metal carbonate in the temperature range between about 1550° F. and 1900° F.;

producing a cover on the bath consisting essentially of uniformly distributed graphite particles of low ash content and having particle sizes in the range of about 100 mesh to about 300 mesh; and

mechanically agitating the bath sufficiently to produce a substantially continuous flow of graphite particles from the cover into and throughout the bath to produce a graphite content in the active portion of the bath of between about 1½% by weight and about 7% by weight; and to produce the entrainment of air through the cover, to produce carbon diffusion into the surface of low carbon ferrous metal parts immersed in the bath.

4. A molten salt composition for use in a non-cyanide carbon diffusion process for case-hardening ferrous metal parts consisting of:

from about 0.001% to about 99.99% of a molten alkali metal chloride and from about 0.001% to about 99.99% of a molten alkali metal carbonate in the temperature range between about 1550° F. and 1900° F.; and

graphite particles having a mesh size in the range of about 100 mesh to about 300 mesh forming a cover on the bath and being uniformly dispersed throughout the bath and present in the amount of about 1½% by weight to about 7% by weight of the bath and having an ash content of less than about 1%.

4,153,482

PROCESS FOR SOLDERING USING A PHOSPHORUS-CONTAINING LIQUID FLUX

Robert A. Stayner, Lafayette; Richard C. Fox, San Rafael, and Thornton K. Jones, Greenbrae, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

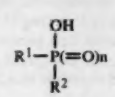
Filed Nov. 15, 1977, Ser. No. 851,670

Int. Cl.[2] B23K *35/34*

U.S. Cl. 148—23 **8 Claims**

1. A process for joining a first metal surface to a second metal surface comprising

(1) applying a liquid flux composition to at least one of said first or second surfaces, said liquid flux composition consisting essentially of an acid of the formula



wherein R^1 and R^2 are hydrogen, hydroxyl, hydrocarbyl, hydrocarbyloxy or oxahydrocarbyl and wherein the total number of carbon atoms contained in said R^1 and R^2 groups is from 8 to 30 carbon atoms, and n is 0 or 1; and

(2) soldering together said first and second surfaces.

4,153,483

DEPOSITION METHOD AND PRODUCTS

Robert A. Holzl, La Canada, Calif., assignor to Chemetal Corporation, Pacoima, Calif.

Division of Ser. No. 588,390, Jun. 19, 1975, Pat. No. 4,040,870, which is a continuation-in-part of Ser. No. 358,110, May 7, 1973, abandoned. This application Apr. 18, 1977, Ser. No. 788,356

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.[2] B32B *15/00, 15/18*

U.S. Cl. 148—31.5 **3 Claims**

1. A coated substrate product comprising a substrate of a material selected from the group consisting of graphite, refractory ceramics, cemented carbides, refractory metals, and iron, nickel and cobalt base materials, upon which has been thermochemically deposited a coherent coating comprised essentialy of titanium and boron in the form titanium diboride free of columnar crystals to a thickness of not less than 1 micron or more than 20 microns and having a superficial hardness of greater than 3500 VHN, wherein the coating is deposited by providing a gaseous volatile halide of titanium, reducing said

volatile halide off the surface of the substrate to form a lower halide of titanium, reacting said lower halide in the presence of a volatile halide of boron downstream from said reduction while maintaining the pressure and substrate temperature such as to cause the deposition on the substrate of an intermediate compound of titanium which is in a liquid phase, and reacting said liquid phase intermediate compound on the surface of the substrate with a volatile halide of boron to produce a hard deposit containing titanium and boron.

4,153,484

HYDROGEN STORAGE MATERIAL

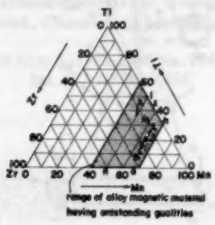
Takaharu Gamo, Fujiidera; Yoshio Moriwaki, Moriguchi; Toshio Yamashita, Katano, and Masataro Fukuda, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 18, 1977, Ser. No. 760,421

Claims priority, application Japan, Jan. 20, 1976, 51-5635; Jan. 20, 1976, 51-5632; Apr. 14, 1976, 51-42841; Apr. 14, 1976, 51-42842

Int. Cl.² C22C *22/00*

U.S. Cl. 148—32 **18 Claims**



1. A Ti-Zr-Mn ternary alloy which is substantially a Laves phase intermetallic compound having a hexagonal $MgZn_2$ (C14) type crystal structure with crystal structure parameters a and c which have values in the range:

$a = 4.80 \sim 5.10$ Å,

$c = 7.88 \sim 8.28$ Å.

4,153,485

PROCESS FOR HEATING STEEL POWDER COMPACTS

Kazuo Ogata, and Seiya Furuta, both of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation of Ser. No. 644,921, Dec. 29, 1975, abandoned. This application Aug. 17, 1977, Ser. No. 825,470

Claims priority, application Japan, Dec. 28, 1974, 49/3942

Int. Cl.² C21D *1/00*

U.S. Cl. 148—126 **13 Claims**

1. A process for deoxidizing steel powder compacts which comprises: admixing and compacting with steel powder a quantity of carbon x_c; wherein x_c is the carbon concentration in said steel powder compact prior to deoxidation and is

$$x_c = \frac{3}{4}(x_o - y_o) + y_c$$

wherein x_o is the oxygen concentration of said steel compact prior to deoxidation;

y_o is the oxygen concentration of said steel compact after deoxidation; and

y_c is the carbon concentration of said steel compact after oxidation wherein all concentrations are by weight;

heating said steel powder compact in the presence of an atmosphere which comprises a primary gas consisting essentially of hydrogen, carbon monoxide and at least 80 volume percent of an inert gas and 0.1 to 5 volume percent based on the volume of said primary gas of a secondary gas consisting essentially of a paraffinic hydrocarbon; and

recovering a deoxidized steel powder compact free of carburized or decarburized layers.

4,153,486

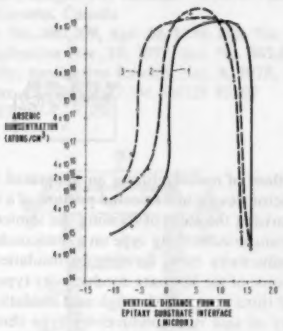
SILICON TETRACHLORIDE EPITAXIAL PROCESS FOR PRODUCING VERY SHARP AUTODOPING PROFILES AND VERY LOW DEFECT DENSITIES ON SUBSTRATES WITH HIGH CONCENTRATION BURIED IMPURITY LAYERS UTILIZING A PREHEATING IN HYDROGEN

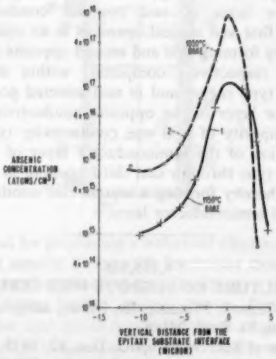
Gurumakonda R. Srinivasan, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,660

Int. Cl.² H01L *21/205, 21/302*

U.S. Cl. 148—175 **7 Claims**





1. A method for forming an epitaxial silicon layer less than about 2 microns thick with very low electrically active defect densities and low leakage current and high MOS lifetimes comprising:

bake bare silicon substrate having buried dopant layers therein and with a surface concentration above about 1×10^{20} atoms per cm^3 N type at 1120° to 1180° C. in hydrogen; and

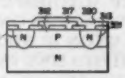
grow an epitaxial layer using silicon tetrachloride between about 1000° to 1100° C.

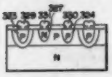
4,153,487

METHOD OF MANUFACTURING INTERGRATED INJECTION LOGIC SEMICONDUCTOR DEVICES UTILIZING SELF-ALIGNED DOUBLE-DIFFUSION TECHNIQUES

Yukuya Tokumaru; Masanori Nakai; Satoshi Shinozaki; Junichi Nakamura; Shintaro Ito, and Yoshio Nishi, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Division of Ser. No. 644,294, Dec. 24, 1975, Pat. No. 4,058,419.
This application Aug. 5, 1977, Ser. No. 822,194
Claims priority, application Japan, Dec. 27, 1974, 49/148795; Dec. 27, 1974, 49/148796; Dec. 27, 1974, 49/148797; Dec. 27, 1974, 49/1913
Int. Cl.[2] H01L *21/22, 21/76, 27/04*
U.S. Cl. 148—175 8 Claims





1. A method of manufacturing an integrated injection logic semiconductor device in a selected portion of a semiconductor layer comprising the steps of forming the semiconductor layer of the opposite conductivity type on a semiconductor substrate of one conductivity type; forming an insulation film on said semiconductor of the opposite conductivity type; forming first, second and third openings through said insulation film; doping an impurity of said one conductivity type through said first opening thereby forming a first one conductivity type region; doping an impurity of the opposite conductivity type into said semiconductor layer of said opposite conductivity type through said first and second openings in an oxidizing atmosphere thereby forming first and second opposite conductivity type regions respectively completely within said first one conductivity type region and in said selected portion of said semiconductor layer of the opposite conductivity type; and doping an impurity of said one conductivity type into said selected portion of the semiconductor layer of the opposite conductivity type through said third opening in an oxidizing atmosphere thereby forming a second one conductivity type region in said semiconductor layer.

4,153,488

MANUFACTURE OF FIBROUS WEB STRUCTURES

Donald E. Wiegand, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Continuation of Ser. No. 640,162, Dec. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 407,934, Oct. 19, 1973, Pat. No. 3,939,532, which is a continuation-in-part of Ser. No. 253,098, May 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 46,594, Jun. 16, 1970, abandoned. This application Dec. 5, 1977, Ser. No. 857,806
Int. Cl.[2] B29J *5/00*
U.S. Cl. 156—62.2 12 Claims

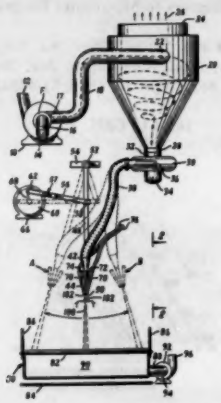
1. The method of forming a felted fibrous structure having an improved coefficient of uniformity of random orientation of fibers therein by projecting an air fiber stream containing cellulosic type fibers with length of 0.25 inch or less from a nozzle for collection on a porous collection surface comprising the steps of:

(a) forming a relatively dilute air suspension of substantially individualized cellulosic type fibers in which at least one half of the fibers have a length of 0.25 inch or less;

(b) selecting a nozzle with outlet of a rectangular type configuration from about 0.5 to about 4.0 inches wide and from about 0.5 inch to about 10.0 feet long for projecting said air suspension of fibers as a jet stream;

(c) positioning said nozzle above said porous collection surface with the nozzle outlet from about 2.5 feet to about 8.25 feet away from said collection surface;

(d) projecting said air suspension of fibers from said selected nozzle as a jet stream at a linear velocity of at least 2,000



feet per minute to about 10,000 feet per minute toward said collection surface;

(e) applying suction to the opposite side of said porous collection surface from that which faces the nozzle to draw collecting air through the porous collection surface; and

(f) correlating the selected nozzle configuration to the distance between the nozzle outlet and collection surface and positioning the nozzle outlet at a selected correlated distance above the collection surface where the fibers in said projected jet stream will move as individualized fibers without formation of clots in a uniform and direct path from said nozzle to said collection surface and from thereon a felted structure in which the fibers are uniformly felted in random orientation to provide an optical coefficient of variation not greater than about 6.0 percent.

4,153,489

SLIDE FASTENER CHAIN WITH WIDE GAP AND METHOD AND APPARATUS FOR MANUFACTURE

George B. Moertel, Conreautville, and James R. Johnston, Meadville, both of Pa., assignors to Textron Inc., Providence, R.I.

Division of Ser. No. 689,415, May 24, 1976, Pat. No. 4,054,973.
This application Aug. 26, 1977, Ser. No. 828,067
Int. Cl.[2] B29C *27/08;* A41M *37/00*
U.S. Cl. 156—73.3 8 Claims

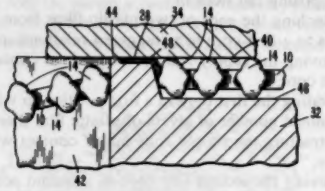
1. A method of gapping a slide fastener chain comprising

cutting out a section of the chain including several interlocking fastening elements of each stringer of the chain along with respective inner edge portions of the carrier tapes supporting the several fastening elements,

compressing and fusing thermoplastic threads of the carrier tapes in a band bordering the cutout section,

said cutting out and compressing being performed by engaging a pair of die members with the chain wherein the die members have a cutting edge defining the cut out section

and have a plateau around the cutting edge defining the band, and



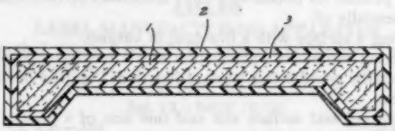
said fusing being performed by applying ultrasonic vibrations to one of the pair of die members.

4,153,490

METHOD OF MANUFACTURING COATED COMPOSITE ARTICLES FROM A NON-FLOWABLE MIXTURE, AND ARTICLES OBTAINED THEREBY

Jakob F. Werz, and Edmund E. Munk, both of Oberstenfeld, Fed. Rep. of Germany, assignors to Werzalit, J. F. Werz Jr. KG Pressholzwerk, Oberstenfeld bei Stuttgart, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,236
Int. Cl.² B32B *31/04*
U.S. Cl. 156—85 **4 Claims**



1. In a method of manufacturing a composite article by bonding a coating layer selected from the group consisting of a fabric, a veneer, a printed paper sheet or foil or a synthetic plastic material foil to a surface of a heat-hardenable body comprising a non-flowable mixture of fibrous material admixed with a heat-hardening binder at a temperature at which the material of the body hardens and concomitantly shrinks and at which the material of the coating layer softens, the improvement comprising the step of uncoupling the coating layer from the body during the shrinkage of the latter by interposing between the coating layer and the surface of the body prior to heating the same to said temperature, an intermediate layer of a material selected from the group consisting of soda craft paper, metallic foil, asbestos fibers and glass fibers fleece which bonds with the coating layer and with the body and which softens at a slower rate than that of the coating layer when heated to said temperature so that, due to the differential softening rates of the layers, the intermediate layer supports the coating layer on the body during the shrinkage of the latter and protects the coating layer from wrinkling resulting from such shrinkage.

4,153,491

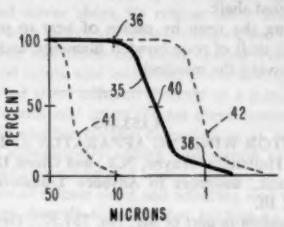
ACCELERATED SINTERING FOR A GREEN CERAMIC SHEET

William R. Swiss, Bloomfield, N.J., and Wayne S. Young, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 319,113, Dec. 29, 1972, Pat. No. 4,039,338. This application Feb. 14, 1977, Ser. No. 768,521
Int. Cl.² C04B *35/64*
U.S. Cl. 156—89 **5 Claims**

1. A method of forming a solid integrated circuit interconnection dielectric substrate comprising the steps of:

(a) forming a flexible ceramic dried green sheet having a high content of ceramic particles, the said ceramic particles having a uniform distribution with an average particle size represented by point **40** on the graph of FIG. **8** with



95% of said particles falling within two microns of said point, and

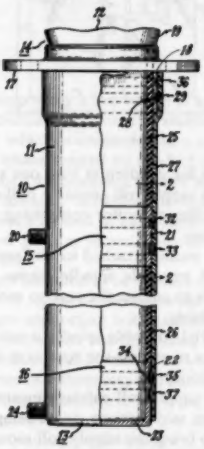
heating said green sheet directly to its sintering temperature for forming said solid dielectric substrate.

4,153,492

METHOD OF FORMING A DRY WELL FUSEHOLDER

Stanley F. Sack, St. Andrews E., and Morris Mattuck, Lachute, both of Canada, assignors to Canadian General Electric Company, Ltd., Toronto, Canada

Division of Ser. No. 680,209, Apr. 26, 1976, Pat. No. 4,081,778. This application Dec. 15, 1977, Ser. No. 861,093
Claims priority, application Canada, Sep. 8, 1975, 234994
Int. Cl.² B65H *81/04*; H01H *85/02*
U.S. Cl. 156—172 **6 Claims**



1. A method for producing a leakproof electrical fuseholder having a first annular fitting with fuseholder mounting means thereon, a second conductive annular fitting, a third conductive annular fitting having an end closure, first and second insulating tubes, and a resin bonded filament wound outer shell supporting said fittings and tubes alternately in an abutting coaxial array having a uniform inner cylindrical surface, said method comprising the following steps;

(1) Placing at least one annular seal around the peripheral surface of said first and third fittings near the edge thereof abutting a tube, and placing at least two annular seals around the peripheral surface of said second fitting near the edges thereof abutting the tubes, said seals being composed of a material which swells on contact with a dielectric liquid;

(2) Supporting said fittings and tubes on a mandrel in abut-

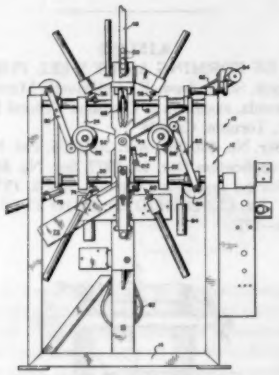
ting relation in the following order; first fitting, first tube, second fitting, second tube, and third fitting;
(3) Winding resin impregated filaments in a predetermined geometric pattern over said fittings and tubes to form an elongated shell;
(4) Curing the resin by means of heat to provide a solid wound shell of resin bonded filaments; and
(5) Removing the mandrel.

4,153,493

CAPACITOR WINDING APPARATUS AND METHOD

Jacob den Hollander, Wayne, N.J., and Glenn D. Rayno, Fairfield, Conn., assignors to Advance Transformer Company, Chicago, Ill.

Continuation-in-part of Ser. No. 731,377, Oct. 12, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,015
Int. Cl.[2] B65C *9/04*
U.S. Cl. 156—188 **59 Claims**



1. An apparatus for winding at least one strip of metallized plastic film from a supply roll around a hollow core to form a metallized plastic film capacitor comprising:
(a) support means;
(b) core supply means attached to said support means;
(c) first coaxial rotatable spindle means attached to said support means to engage the core so as to rotate said core in a first position;
(d) second coaxial rotatable spindle means attached to said support means to engage the core as to rotate said core in a second position;
(e) at least one supply roll carriage means attached to said support means, said carriage means being movable along a linear path to bring the supply roll mounted thereon into and out of tangential contact with the core when it is in the first position;
(f) means to move said at least one carriage along a linear path of travel;
(g) tension means to maintain a predetermined tension in the plastic film between the supply roll and the core during the linear travel of the at least one carriage means;
(h) feed finger means to grip the core in the first position after the plastic film has been wound thereon and move it along a linear path to the second position;
(i) first attaching means to attach an end of the at least one strip of plastic film to the core when it is in the first position;
(j) second attaching means to sever the at least one strip of plastic material from a wound core placed in the second position and attach it to a core placed in the first position, and;
(k) driving means to rotate the first and second coaxial rotatable spindle means.

33. A method of winding a dry metallized plastic film capacitor comprising the steps of:
(a) attaching the ends of two plastic films from two supply rolls to a first core in a staggered relationship;
(b) moving the supply rolls into tangential contact with the first core;
(c) rotating the first core in a first position to wind a predetermined number of layers of plastic film thereon;
(d) retracting the supply rolls out of contact with the first core;
(e) moving the wound first core to a second position;
(f) inserting a second unwound core into said first position;
(g) attaching the two films to the second core in a staggered relationship and severing the film connecting the first and second core; and
(h) sealing the free ends of the film to the first, wound core.

4,153,494

PROCESS FOR OBTAINING BRIGHTLY METALLIZED SURFACES

Enrique Vilaprinyo Oliva, Ronda del General Mitre, No. 64, Barcelona, Spain

Filed Dec. 12, 1975, Ser. No. 640,392
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.[2] B44C *1/10;* **B32B** *31/12, 15/02*
U.S. Cl. 156—230 **6 Claims**

1. A process for obtaining a shiny metallized surface consisting essentially of:
coating a surface with a fine coat of varnish,
covering one side of a plastic film with a metallizing agent of metallic powder in a layer of less than 1 micron in thickness;
laminating said surface and said one side of a plastic film before said varnish is set so that said metallizing agent is absorbed into said varnish;
leaving said film in contact with said surface until said varnish is set, whereupon said film acts as a glossing element; and removing said film from said surface.

2. A process for obtaining a shiny metallized surface comprising
covering one side of a plastic film with a metallizing agent of a metal powder in a layer of less than 1 micron in thickness;
coating said side with a fine coat of varnish;
laminating said side of said film and a surface before said varnish has set whereupon said varnish and said metallizing agent are transferred to said surface;
leaving said film in contact with said surface until said varnish sets, whereupon said film acts as a glossing element; and
removing said film from said surface.

4,153,495

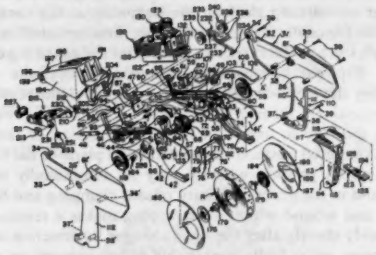
HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 790,519, Apr. 24, 1977, Pat. No. 4,116,747. This application Feb. 7, 1978, Ser. No. 875,719
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—384 **2 Claims**

1. Hand-held apparatus for printing and applying pressure sensitive labels, comprising: a frame having a handle, a manually operable actuator disposed at the handle; a subframe disposed in and connected to the frame, the subframe having a pair of mating side-by-side first and second subframe sections, means for supporting a label roll composed of labels releasably secured by pressure sensitive adhesive to a supporting material web, and means defining a path for the web through the subframe, the first subframe section having a first recess and the

second subframe section having a second recess opposite the first recess, a platen retained at opposite side portions in the respective recesses, the platen having an end edge, a print head cooperable with the platen, a peel roller rotatably mounted and captive at its end portions in the first and second recesses and in contact with the end edge of the platen, wherein the end



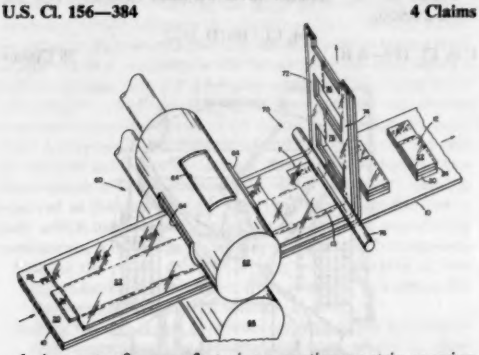
edge is defined by two projections for contacting only the end portions of the peel roller, means disposed adjacent the peel roller for applying printed labels, and means responsive to movement of the actuator for moving the print head into printing cooperation with the platen and for advancing the web.

4,153,496

LABEL MANUFACTURING APPARATUS

Kenneth J. Swift, Keene, N.H., assignor to Markem Corporation, Keene, N.H.

Filed Feb. 27, 1978, Ser. No. 881,555
Int. Cl.[2] B41F *19/00*
U.S. Cl. 156—384 **4 Claims**



1. Apparatus for manufacturing a continuous strip carrying individual permanently mounted pressure sensitive adhesive labels, having pressure sensitive adhesive transparent hinged covers with release sheets thereon for protectively covering information subsequently added to the label, from a continuous strip base sheet having a pressure sensitive adhesive surface with a continuous strip base release sheet adhered thereto and a continuous strip transparent cover sheet having a pressure sensitive adhesive surface with a continuous strip cover release sheet adhered thereto, said apparatus comprising

cover sheet slitting means for continuously slitting only said cover release sheet and removing at least one edge portion thereof to expose at least one edge portion of the pressure sensitive adhesive surface of said transparent cover sheet while maintaining a portion of said cover release sheet thereon

laminating means for laminating said transparent cover sheet to the face of said base sheet by adhering thereto the pressure sensitive adhesive surface edge portion of said transparent cover sheet, with said maintained portion of said cover release sheet interposed between said transparent cover sheet and the face of said base sheet and

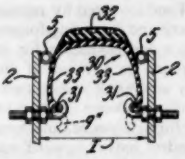
cutting means for cutting individual labels on said continuous base sheet release strip by cutting through only said transparent cover sheet, its release sheet and said base sheet and with said cover release sheet extending to one of the edges of said labels and being spaced from the other edge of said labels, said individual labels having said transparent cover sheet adhered directly to a portion only of said labels with said cover release sheet interposed therebetween in another portion extending to an edge of said labels for subsequently adding information to said other portion and protecting said added information by removing said cover release sheet and adhering said transparent cover sheet directly to said other portion to cover said added information.

4,153,497

DEVICE FOR THE RECAPPING OF TIRES

Elio Budrioli, Turin, Italy, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jan. 19, 1978, Ser. No. 870,760
Claims priority, application France, Jan. 20, 1977, 73.01843
Int. Cl.[2] B29H *5/04*
U.S. Cl. 156—394 **2 Claims**



1. Device for supporting a tire which is to be recapped and for applying hermetically against the sidewalls of said tire a flexible sheathing which is connected to a source of vacuum, said device being characterized by the fact that it comprises:

(a) support means for supporting the tire by its beads and for varying the distance between the beads, said support means being each formed of axial elements terminated by a hook-shaped portion intended to be engaged on the inside of the tire;

(b) annular means intended to be applied against the flexible sheathing in the region of the sidewalls of the tire;

(c) bearing means supporting both said support means and said annular means, said bearing means facing each other with an adjustable axial distance bwtween them; and

(d) connecting means connecting said bearing means to each other and making it possible to vary the distance between said bearing means.

4,153,498

METHOD AND APPARATUS FOR MANUFACTURE OF INSULATING SLEEVES

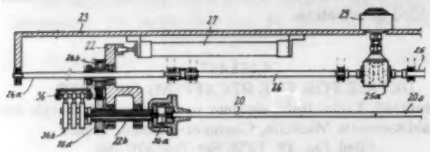
Bernard H. Bichot, Clermont, and René Gest, Rantigny, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 578,087, May 16, 1975, abandoned.
This application Jan. 24, 1977, Ser. No. 761,564
Claims priority, application France, May 17, 1974, 74 17232
Int. Cl.[2] B65C *3/12*
U.S. Cl. 156—446 **4 Claims**

1. Mandrel mechanism for use in forming a fibrous insulating sleeve or tube from a mat of fibrous material having a heat curable binder dispersed therein, the mandrel comprising two mandrel halves mounted for movement of their inner ends toward and away from each other, and each mandrel half being formed of electrically conductive metal and having

internal heating means to provide for curing of binder in the inside layer of the fibrous material of the sleeve being formed on the mandrel, the heating means comprising an electrical resistance heating element within each mandrel half electrically connected at its inner end with the inner end portion of the mandrel, and electric current supply connections for said heating element electrically connected with the outer end of the mandrel half and with the outer end of said element.

2. Apparatus for making fibrous insulating sleeves or tubes from fibrous material in mat form, comprising a mandrel formed of two mandrel halves in end-to-end relation, means for rotating the mandrel halves to wind the fibrous mat on the mandrel when the mandrel halves are positioned with their inner ends adjacent to each other and thereby form an insulat-



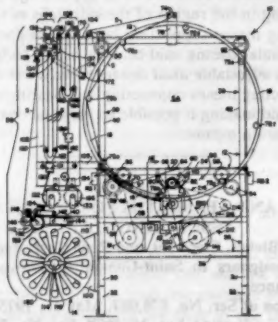
ing sleeve, means mounting the mandrel halves for axial movement toward each other and for axial separation of the mandrel halves to positions beyond the ends of an insulating sleeve wound thereon a cluster of at least three rollers positioned around the mandrel and mounted for rotation about axes paralleling the mandrel axis and providing for pressure rolling of the mat wound on the mandrel, means for rotating said rollers during axial separation movement of the mandrel halves, means for relatively separating at least two of said rollers after formation of an insulating sleeve on the mandrel to provide for withdrawal of the formed sleeve, and means for guiding the motion of the mandrel halves toward each other including means for bringing said rollers into engagement with the mandrel halves during movement of the mandrel halves toward each other.

4,153,499

SLIP-FEED STRAPPING MACHINE

James R. Annis, Palatine, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Jun. 13, 1977, Ser. No. 805,645
Int. Cl.[2] B65B *13/10*
U.S. Cl. 156—494 **32 Claims**



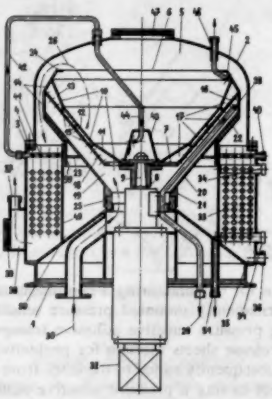
1. In a machine operative upon successive lengths of flexible strapping issuing from a strap reel for forming successive strap loops about an object disposed at a strapping area, in combination, releasable means for clamping and holding the free end of each successive strapping length in close proximity to the object, a rotatable hoop encircling said strapping area, a carrier mounted on the hoop in slip-feed engagement with the strapping between its free end and the reel, means for successively rotating the hoop in opposite directions to perform successive machine cycles and thus orbit the carrier about the strapping area in either direction to thereby transport the carrier alternately in clockwise and counterclockwise directions to form strap loops having overlapping end portions about the object, a centering device interposed between the carrier and the reel and disposed exteriorly of the hoop, a storage mechanism effectively interposed between the centering device and the reel for assimilating slack in the strapping as the carrier approaches the centering device in either direction and for payng out such slack as the carrier recedes from the centering device, means disposed substantially diametrically opposite to the centering device for sealing said overlapping end portions of the successively formed strap loops, a pair of strap-reversing rollers shiftable in unison in the axial direction of the hoop from a retracted position remote from the plane of the hoop to an advanced position wherein they lie substantially in such plane and in the general vicinity of said clamping and holding means and around which the strapping makes a reverse bend alternately shortly after the hoop changes its direction of rotation, means individually biasing said rollers to positions which, when the rollers are in their advanced positions, are slightly removed from said clamping and holding means, said rollers being forcibly pulled alternately by successive reverse bends against the action of said biasing means into close proximity to said clamping and holding means for cooperation of the latter with the free ends of successive strapping loops, and mean for shifting said strap-reversing rollers.

4,153,500

THIN FILM COATING EVAPORATOR

Vaclav Feres, Haid-und Neu-Strasse 14, D-7500 Karlsruhe 1, Fed. Rep. of Germany

Filed Feb. 26, 1975, Ser. No. 553,213
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1974, 2409502
Int. Cl.[2] B01D *1/22*
U.S. Cl. 159—6 R **25 Claims**



1. A centrifugal rotor construction comprising an evaporation element providing an evaporation surface having a largest and a smallest periphery, an outer casing element spaced apart in facing relationship with respect to that surface of said evaporation element opposite said evaporation surface, the largest periphery of said evaporation surface and outer casing being joined to collectively form a heat-exchange medium chamber therebetween, and a rotationally symmetrical supporting casing permeable to a heat-exchange medium positioned between said evaporation surface and said outer casing, said evaporation element being supported by said supporting casing at at least one point lying between extremely oppositely disposed

peripheries of said evaporation surface as well as the smallest periphery of said evaporation surface.

4,153,501

PROCESS AND APPARATUS FOR REMOVING VAPORIZABLE CONSTITUENTS FROM VISCOUS SOLUTIONS OR MELTS OF THERMOPLASTICS

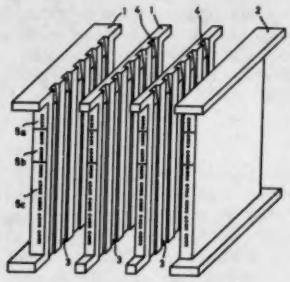
Peter Fink, Speyer; Hans Wild, Frankenthal; Johann Zizlsperger, Schriesheim; Rudi W. Reffert, Beindersheim, and Gunter Thielen, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 14, 1977, Ser. No. 768,636

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606612

Int. Cl.² B01D *1/22*

U.S. Cl. 159—49 **5 Claims**



1. In a process for removing vaporizable constituents from high-viscosity solutions or melts of thermoplastics by continuous evaporation along a heated devolatilization zone and separation of the vapor phase and the liquid phase in a downstream separating vessel, wherein the plastic solution or melt is first heated stepwise in increments to the devolatilization temperature by indirect heat exchange in the devolatilization zone under a pressure greater than the saturation pressure of the vaporizable constituents at the prevailing temperature, and the vaporizable constituents are then evaporated in the devolatilization zone under a pressure lower than the saturation pressure of the said constituents at the devolatilization temperature to form a two-phase system of vapor and melt, whereupon the vapor phase is removed in the downstream separating vessel and the plastic melt, which has been substantially freed from the vaporizable constituents, is discharged, the improvement which comprises:

forming the plastic solution or melt into a plurality of thin layers having a thickness of from about 0.5 to 4 mm at the temperature of said feed solution or melt;

heating the thin layers of solution or melt to the devolatization temperature by causing said thin layers to flow through the heated devolatization zone in product flow zones, said devolatization zone being heated by a transfer medium in a stepwise manner in the direction of product flow and containing at least two independent heating zones;

controlling the temperature throughout the devolatization zone such that the temperature difference between the heat transfer medium in the independent heating zones and the thin layers is always less than 50° C.; and

substantially returning to the thin layer of solution or melt through the heated devolatization zone the heat of evaporation which is abstracted from said thin layer of evaporation of vaporizable components contained therein, whereby the drop in temperature of said thin layer due to evaporation of the vaporizable components is not more than 30° C.; and

whereby vaporizable components are removed without exposing the product to excessive heat and without causing damage to the product.

4,153,502

PROCESS FOR THE PRODUCTION OF POLYSULPHIDE PULPING LIQUOR FROM PULP MILL RECOVERY SMELT

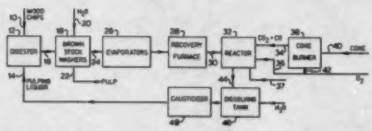
Walter A. Mueller, Dorval, Canada, assignor to Corrosion Service Company Limited, Toronto, Canada

Filed May 1, 1978, Ser. No. 901,589

Claims priority, application United Kingdom, May 6, 1977, 19210/77

Int. Cl.² D21C *1/00, 3/02, 3/24, 11/04*

U.S. Cl. 162—17 **18 Claims**



1. A method of forming sodium polysulphide and sodium carbonate, which comprises subjecting a pulp mill recovery smelt mixture of sodium sulphide, sodium carbonate and at least one sodium sulphur-oxygen salt selected from sodium sulphate, sodium sulphite and mixtures thereof to a high temperature oxidation-reduction reaction at a temperature of about 650° to about 1000° C. in the presence of sufficient carbon and additional oxygen to conform stoichiometrically with the sodium and sulphur present in said mixture to achieve the overall reaction represented by the partial equation:

$$Na+S+O+C \rightarrow Na_2S_{(1+x)}+Na_2CO_3$$

wherein x is at least about 0.4 and to form a mixture of sodium polysulphide and sodium carbonate substantially free from sodium sulphur-oxygen salts; and recovering said mixture of sodium polysulphide and sodium carbonate.

4,153,503

METHOD OF WET-FORMING MINERAL FIBERBOARD PRODUCT HAVING DAMAGE-RESISTANT OVERLAY

Alfred E. Booth, Westfalen, Fed. Rep. of Germany, and Daniel W. Schutter, Millersville, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Apr. 2, 1973, Ser. No. 347,050

Int. Cl.² D21F *11/00*

U.S. Cl. 162—123 **12 Claims**

1. The method of producing a low density mineral fiberboard having a damage-resistant surfacing comprising:

(a) forming a standard low density water-laid mat from a water slurry having a solids consistency of from about 1.5 to 4.5 percent by weight and comprised of mineral fibers, organic binder and cellulosic fibers by flowing the slurry onto the forming wire of a fourdrinier;

(b) at the point on the forming wire where the mat being formed thereon has a solids content of between about 7 and 12 percent by weight, applying, by means of a secondary head box, a second slurry having a solids consistency of between about 10 and 15 percent, a Canadian Standard Freeness of between about 150 and 300, and comprised of refined mineral fiber, organic binder, cellulosic fibers, perlite and clay; and

(c) dewatering the two layers to form an integral sheet and drying said sheet to form a board having a low density backing layer with a high density surfacing layer which is firmly bonded throughout.

8. A thermal and acoustical insulating composition comprising a thermally expanded mineral aggregate, a defibrillated fibrous material, and a binder wherein said insulating composition is in the form of a structural insulating board and wherein a coating containing mineral fibers, a binder, and defibrillated

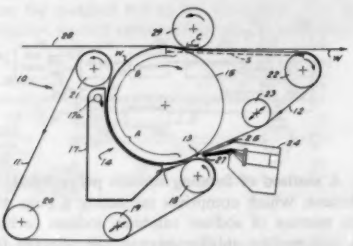
fibrous materials, is applied to at least one major surface of such structural insulating board.

4,153,504

TWIN-WIRE FIBROUS WEB FORMER AND METHOD

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 31, 1977, Ser. No. 764,445
Int. Cl.[2] D21F *1/40, 2/00*; D21H *1/06*
U.S. Cl. 162—133 **19 Claims**



15. A method of continuously forming a fibrous web from a slurry of stock without any need for suction roll means or suction box means, comprising:

directing a stream of slurry of stock into a converging throat leading to a forming run between endless foraminous inner and outer forming belts held under tension to apply a pressing force against the stock within the belts running over a first imperforate convexly curved surface providing the forming run within the inner of the belts;

separating the outer belt from the wet web and maintaining the wet web on the inner belt;

running the inner belt carrying the wet web for a limited distance over a second imperforate convexly curved surface providing a transfer transition run beyond said forming run;

guiding the inner belt to separate the inner belt and the wet web carried thereby from the second curved surface on a free span of said inner belt diverging from said second surface;

running a porous pickoff belt toward the off-running end portion of the second curved surface and into pickoff engagement with the wet web on said inner belt;

engaging a substantial convex area of an imperforate rotary pickup roll into corunning engagement with the pickoff belt adjacent to but spaced downstream in nip-free relation from the off-running end of said second surface and pressing said convex area into contact with substantial pressure against the pickoff belt and thereby deflecting the pickoff belt and the free span of the inner belt a limited distance toward said second surface and squeezing the wet web tightly between said pickoff belt and the inner belt;

guiding the inner belt to run divergently away from said pickoff belt commencing at the off-running end of the area of pressing contact between the pickup roll and the pickoff belt.

squeezing air from between said area of pressing contact and the pickoff belt and web and the inner belt;

and effecting a vacuum between the corunning pickup roll and the offrunning portion of the pickup belt and causing suction of air through said pickup belt and said web and said inner belt and forcing the wet web to leave the inner belt and adhere to the pickoff belt adjacent to the point where the pickoff belt diverges from the off-running side of said area of pressing contact and the inner belt diverges from the pickoff belt.

16. A method according to claim **15**, comprising transferring at least one additional wet web into union with said wet web adhering to the pickoff belt, and thereby forming a multi-ply web.

4,153,505

SORBENT MATERIALS

Alan N. Ferguson, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1975, Ser. No. 576,223
Claims priority, application United Kingdom, May 10, 1974, 20868/74
Int. Cl.[2] D21H *3/48*
U.S. Cl. 162—164 R **7 Claims**

1. A composite sorbtive material comprising a self-supporting, fluid permeable sheet of fibrous material in which a powdered sorbent black thermoset foam has been distributed throughout the sheet and retained in the sheet by the fibrous material, said foam having been prepared by the pyrolysis of a composition liquid at the pyrolysis temperature comprising at least one aromatic nitrogen-containing compound having the general formula:

X—Ar—Y

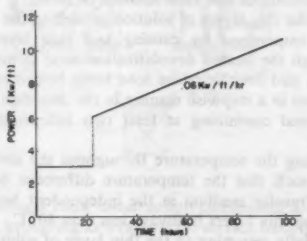
in which Ar represents an aromatic nucleus, X represents a substituent having a negative Hammett sigma constant and attached by a nitrogen, oxygen or sulphur atom, and Y represents a substituent having a positive Hammett sigma constant and attached by a nitrogen atom, the substituents X and/or Y forming part of a ring fused onto the aromatic nucleus or attached directly to the aromatic nucleus, the thermoset foam having a specific surface area of at least 50 m^2/g, and said pyrolysis comprising heating said composition to a temperature below 300° C. to initiate reaction of the said composition.

4,153,506

METHOD OF STARTING OPERATION OF A NUCLEAR REACTOR

Hideo Maki, Katsuta; Takanori Hosokawa, Hitachi, and Katsutoshi Shinbo, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 14, 1976, Ser. No. 723,065
Claims priority, application Japan, Sep. 17, 1975, 50-111629
Int. Cl.[2] G21C *7/06*
U.S. Cl. 176—20 R **10 Claims**



1. A method of starting operation of a nuclear reactor in which fresh fuel rods are installed of the type having a plurality of cylindrical oxide pellets and a moisture getter enclosed in an elongated tubular cladding of a zirconium alloy comprising:

a first step of increasing fuel power produced by the fuel rods to a fuel power amount below an amount which causes an interaction between the pellets and the claddings in the fuel rods,

a second step of maintaining the fuel power amount below the interaction amount for a predetermined period, and

a third step of increasing the fuel power amount to a desired maximum power level of the nuclear reactor after the predetermined period.

4,153,507

Patent Not Issued For This Number

4,153,508

PROCESS FOR THE PRODUCTION OF NOVEL POLYSACCHARIDE

Kenichi Hisatsuka; Saburo Ishiyama; Akira Inoue; Osamu Tsumura, all of Sodegaura, and Mikio Sato, Ichihara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Division of Ser. No. 759,627, Jan. 17, 1977. This application Oct. 6, 1977, Ser. No. 839,900

Claims priority, application Japan, Jan. 19, 1976, 51/4051; Apr. 5, 1976, 51/37224

Int. Cl.[2] C12D *13/04*

U.S. Cl. 195—31 P **2 Claims**

1. A process of producing a polysaccharide having a gel forming property which is characterized by the following properties: (1) comprising (a) glucose, (b) mannose, (c) dihydrostreptose and (d) 3-O-(1′ carboxyethyl)-L-rhamnose, the molar ratio of said constituents being (a):(b):(c):(d)=10:10:1–3:3–8, and (2) containing an O-acetyl group in an amount of from 8 to 14 weight percent calculated as acetic acid;

which comprises cultivating a microorganism *Arthrobacter carbazolum* in a medium containing assimilable carbon sources and nitrogen sources until said polysaccharide is formed and substantially accumulated in the culture, and recovering the accumulated polysaccharide therefrom.

4,153,509

MICROBIAL PRODUCTION OF HYDROXYLATED BIPHENYL COMPOUNDS

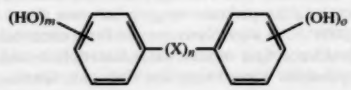
Robert D. Schwartz, Nitro, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,808

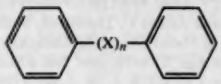
Int. Cl.[2] C07B *29/02*

U.S. Cl. 195—51 R **13 Claims**

1. A microbiological transformation process for preparing a hydroxylated compound of the formula:



by contacting a compound of the formula:



with a microorganism selected from the genus Absidia, for a period of time sufficient to produce any amount of said hydroxylated compound, wherein

m, n and o are individually 0 or 1, with the proviso that both m, n and o are individually 0 or 1, with the proviso that both n and o cannot be 0;

X is one or more divalent phenyl, oxygen, sulfur, sulfinyl, sulfonyl, carbonyl, amino or alkylamino; or X is a divalent alkylene, alkenylene, alkynylene, cycloalkylene or cycloalkenylene chain which may optionally include one or more divalent oxygen, sulfur, sulfinyl, sulfonyl, carbonyl, amino or alkylamino moieties in any combination.

4,153,510

HIGH SURFACE LOW VOLUME BIOMASS COMPOSITE

Ralph A. Messing, Horseheads, and Robert A. Oppermann, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,278

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—59 **16 Claims**

1. An immobilized microbe composite comprising a porous, high surface area inorganic support having a controlled population of microbes bonded to the internal surfaces of the pores, the support being water-insoluble, non-toxic to the microbes, and having a controlled porosity such that at least 70% of the pores, on a pore size distribution basis, have a pore diameter at least as large as the smallest major dimension of the microbes but less than about five times the largest major dimension of the microbes.

4,153,511

STABILIZED LIQUID COENZYME COMPOSITIONS

Ivan E. Modrovich, 591 Beverly Dr., Camarillo, Calif. 93010

Continuation of Ser. No. 667,857, Mar. 17, 1976, abandoned. This application Feb. 2, 1977, Ser. No. 764,826

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—99 **43 Claims**

32. A stabilized liquid coenzyme composition used in biological diagnostic determinations and where said coenzyme affects the reactivity of an enzyme in such biological diagnostic determinations, said composition comprising a labile coenzyme which is unstable in aqueous media, said coenzyme being dissolved in a non-reactive, water-miscible, organic solvent which is liquid at room and refrigerator temperatures containing at least 1% V/V of an inert, solid hygroscopic agent such that the water content is less than 0.5%, and where activity of the coenzyme remains unaffected by the presence of the organic solvent in the stabilized composition or in a biological diagnostic determination reaction.

4,153,512
STORAGE STABLE ANTIBIOTIC SUSCEPTIBILITY TEST KIT AND METHOD OF TESTING

Eric J. Messner, and Albert C. Dornbush, both of Pearl River, N.Y., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed Apr. 7, 1976, Ser. No. 674,473
Int. Cl.[2] C12K *1/04, 1/06, 1/10*
U.S. Cl. 195—103.5 K **7 Claims**

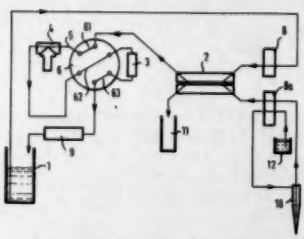
1. A test kit for measuring the antibiotic susceptibility of a microorganism comprising a plurality of integral test chambers, with at least some of said chambers having therein a graduated series of concentrations of an antibiotic and a uniform quantity of poly(vinyl pyrrolidone) as a water-soluble bulking agent and antibiotic retaining carrier, with the antibiotic in dispersed and reconstitutable frozen-dried form in the poly(vinyl pyrrolidone).

5. A method of testing the antibiotic susceptibility of a microorganism by a serial dilution technique comprising: forming a series of concentrations of solutions in water of an antibiotic in a uniform concentration of poly(vinyl pyrrolidone) as a water-soluble bulking agent and antibiotic retaining carrier, loading uniform quantities of said series of concentrations in a series of integral test chambers, freezing and freeze-drying said series of concentrations, storing until time of use, and reconstituting the antibiotic in the poly(vinyl pyrrolidone) by adding a culture medium inoculated with a test microorganism, incubating, and then reading the test microorganism growth.

4,153,513
METHOD AND APPARATUS FOR THE CONTINUOUS DETERMINATION OF THE CONCENTRATION OF AN ENZYME SUBSTRATE

Hermann Edelmann, Tutzing-Unterzeismering; Peter Kraft; Karlheinz Mann, both of Weilheim; Peter Schuler, Munich, and Alexander Hagen, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Aug. 19, 1977, Ser. No. 826,008
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1976, 2642232
Int. Cl.[2] G07N *31/14*
U.S. Cl. 195—103.5 R **17 Claims**



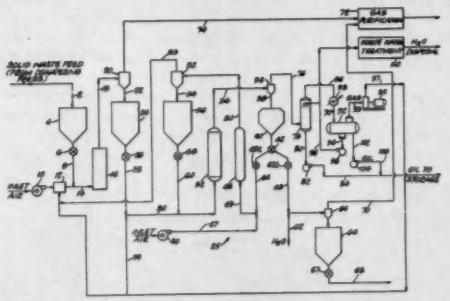
1. Method for the continuous determination of the concentration of an enzyme substrate in an aqueous liquid which comprises introducing a sample containing the substrate to be determined into a current of flowing buffer solution, reacting the substrate contained in said buffer solution with an immobilized enzyme and measuring a physical change in the solution brought about by said reaction using a single measurement chamber, by passing the buffer solution containing the sample to be determined in an alternating manner (i) directly through the measurement chamber thereby producing a first measurement signal and (ii) then over said immobilized enzyme and thereafter through said measurement chamber thereby producing a second measurement signal and comparing the signals to determine the concentration of the substrate.

12. Apparatus for conducting the method as claimed in claim 1 which apparatus comprises a buffer storage container communicating with a sample introduction device, a sample inlet stream also communicating with said sample introduction device, said device being capable of mixing the sample and buffer and communicating with a bridging channel to a chamber holding immobilized enzyme and with a bridging channel to a measurement chamber, and a changeover valve therein adapted to alternatingly open and close said bridging channels to permit alternating communication between said sample introduction device and (i) the immobilized enzyme chamber and (ii) the measurement chamber.

4,153,514
PYROLYSIS PROCESS FOR SOLID WASTES

Donald E. Garrett, Claremont, and George M. Mallan, Pomona, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 553,772, Feb. 27, 1975, abandoned, which is a continuation of Ser. No. 354,247, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 251,074, May 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 61,669, Aug. 6, 1970, abandoned. This application May 17, 1976, Ser. No. 687,150
Int. Cl.[2] C10B *49/20, 53/02*
U.S. Cl. 201—2.5 **40 Claims**



38. A process for recovering chemical values from waste materials containing organic solids comprising the steps of:

a. Forming a turbulent gaseous stream in a mixing zone consisting essentially of carrier gas, particulate waste materials including materials selected from the group consisting of municipal wastes, sewage sludge, plastics, cellulosic materials, manure, agricultural wastes, animal processing wastes, rubber, crude oil processing wastes, and mixtures thereof, having a maximum particle dimension of less than one inch, and particulate hot char wherein the carrier gas is present in an amount of from about 0.2 to about 2 pounds per pound of waste material, such that the waste material and hot char are intimately admixed and entrained within the gaseous portion of the stream, said carrier gas being substantially free of elemental oxygen;

b. Passing said gaseous stream including said waste material and hot char through a pyrolysis zone under turbulent flow conditions and heating the waste material in said stream to a temperature ranging between about 600° F. and 2000° F. in a pyrolysis zone to form chemical values, the residence time of said waste materials in said mixing and pyrolysis zones being less than one minute, the hot

char supplying a portion of the necessary heat to heat the waste material in said pyrolysis zone; and

c. Removing the heated gaseous stream from the pyrolysis zone.

4,153,515

DISCHARGE APPARATUS FOR COKE-OVEN BATTERY

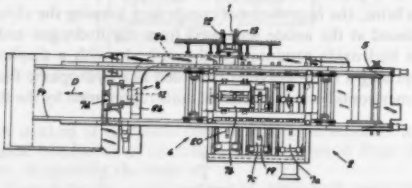
Karl Gregor, Bochum, and Kurt Asmus, Erftstadt, both of Fed. Rep. of Germany, assignors to Gewerkschaft Schalker Eisenhutte, Gelsenkirchen, Fed. Rep. of Germany

Filed Jan. 23, 1976, Ser. No. 651,777

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2529805

Int. Cl.[2] C01B *33/04;* C10B *33/10, 43/00*

U.S. Cl. 202—241 **8 Claims**



1. In a coke oven provided with a battery of coking chambers normally closed at one end by doors whose removal enables the ejection of a coke charge from each chamber, the combination therewith of:

a primary track extending past said battery in a predetermined transport direction;

a main carriage displaceable on said primary track in said transport direction;

a secondary track on said main carriage extending in said transport direction;

an auxiliary carriage limitedly displaceable on said secondary track in said transport direction relatively to said main carriage;

unloading means on said auxiliary carriage comprising a plurality of units disposed alongside one another for independent movement perpendicular to said transport direction toward and away from said battery for opening a selected chamber and enabling removal of the coke charge ejected therefrom, the range of displacement of said auxiliary carriage on said secondary track being sufficient to allow any one of said units to be operatively aligned with a selected chamber upon movement of said main carriage into an approach position close to the selected chamber;

positioning means for displacing said auxiliary carriage on said secondary track and said units on said auxiliary carriage; and generally elbow-shaped conveyor means on said main carriage for carrying off coke breeze dropping from the selected chamber upon the removal of its coke charge, said conveyor means including a longitudinal stretch extending in said transport direction between the path of displacement of said auxiliary carriage and an edge of said main carriage proximal to said battery whereby said coke breeze is removed from said coking chambers and initially carried off at right angles to the direction of removal of said coke charge by said unloading means.

4,153,516

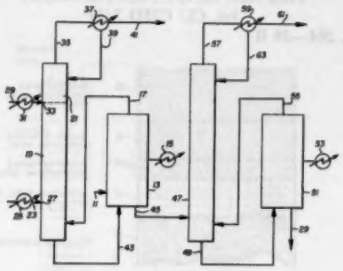
PROCESS FOR SEPARATING ALKOXYKETONE COMPOUNDS FROM THE CORRESPONDING 1-ALKOXY-2-ALKANOL COMPOUND

Denvil E. Reed, and Richard C. Grimm, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 5, 1977, Ser. No. 822,197

Int. Cl.[2] B01D *3/40;* C07C *49/24*

U.S. Cl. 203—64 **13 Claims**



1. A process for separating an alkoxyketone compound from a feed mixture of the alkoxyketone compound and the corresponding 1-alkoxy-2-alkanol compound which comprises:

(a) introducing an extractant solvent selected from the group of aliphatic diols, triols and polyols having from two to six carbon atoms into an extractive distillation zone;

(b) introducing said feed mixture into said extractive distillation zone at a point above the bottom thereof and below the point of entry of said extractant solvent;

(c) subjecting the resulting mixture to extractive distillation in said extractive distillation zone; and

(d) recovering at the top of said extractive distillation zone a distillate fraction containing alkoxyketone compound and some of said extractant solvent substantially free of the corresponding 1-alkoxy-2-alkanol compound.

4,153,517

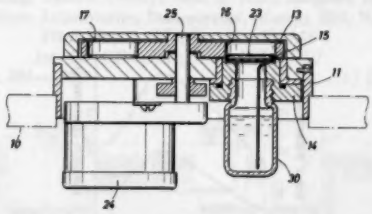
DETECTING TRACE LEAD IN GASOLINES

Donald C. Olson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 22, 1978, Ser. No. 908,292

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **2 Claims**



1. A method for measuring trace amounts of tetraalkyl leads present in a sample of gasoline, said method comprising:

using a porous medium to absorb the sample of gasoline;

exposing the sample of gasoline in said porous medium to air to evaporate aromatics and olefins;

then passing said porous medium in close proximity to one electrode of a galvanic cell having an electrolyte in combination with the electrodes of the cell to render the cell sensitive to tetraaldylleads, and

measuring the amount of tetraalkyl leads in the sample by

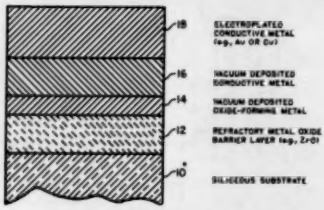
detecting the peak value of the signal produced by the galvanic cell.

4,153,518

METHOD OF MAKING A METALIZED SUBSTRATE HAVING A THIN FILM BARRIER LAYER

Robert E. Holmes, Portland, and Robert R. Zimmerman, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 18, 1977, Ser. No. 852,991
Int. Cl.[2] C25D 5/54
U.S. Cl. 204—38 B **3 Claims**



1. A process of fabricating hybrid circuits on a siliceous substrate, comprising:

depositing on said substrate a barrier layer of a refractory metal oxide to prevent loss of adhesion between the adjacent overlying layer and said substrate during a subsequent electrodeposition step;

vacuum depositing from about 200 to 1,000 Angstroms of an oxide-forming metal selected from the group consisting of chromium, titanium, and tantalum on said refractory metal oxide layer;

vacuum depositing from about 1,000 to 10,000 Angstroms of conductive metal on said oxide-forming metal; and

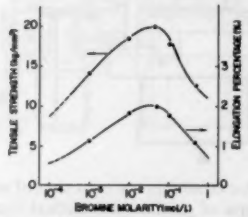
electroplating a layer of conductive metal on said vacuum deposited conductive metal.

4,153,519

SILVER-ELECTROPLATING METHOD USING THIOCYANIC SOLUTION

Yoshihiro Suzuki, Hitachi; Tadashi Minakawa, Mito, and Osamu Asai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 765,787, Feb. 4, 1977, abandoned. This application May 31, 1978, Ser. No. 911,077
Claims priority, application Japan, Feb. 4, 1976, 51-10392; Sep. 20, 1976, 51-111768
Int. Cl.[2] C25D 3/46, 5/10
U.S. Cl. 204—40 **11 Claims**



1. A method of electroplating a metallic substrate with silver, which comprises steps of subjecting the substrate to preplating under a cathode current density of 0.1 to 80 mA/dm^2 in an aqueous solution containing silver ions of 0.001 to 0.02 mole/l and thiocyanic ions of 0.1 to 5 moles, and electroplating the substrate preplated with silver in an aqueous solution containing silver ions 0.04 to 0.8 mole/l, thiocyanic ions of 0.5 to 10 moles/l and a film-improving agent in an amount sufficient to suppress a local growth of silver deposition under a cathode current density of 0.5 to 10 A/dm^2.

4,153,520

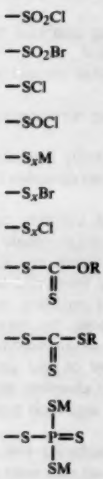
METHOD FOR THE ELECTROLYTIC PRODUCTION OF CHLORINE FROM BRINE

James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 699,302, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,099, May 20, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,467
Int. Cl.[2] C25B 1/16, 1/26, 13/08
U.S. Cl. 204—98 **1 Claim**

1. In a process for the electrolytic production of chlorine from brine, the improvement comprising keeping the chlorine produced at the anode separated from the hydrogen and sodium hydroxide produced at the cathode with a diaphragm comprising a fluoropolymer provided as a hydrophilic fluoropolymer containing nonterminal units represented by the structure

where Z is



where

M is hydrogen, sodium, potassium, lithium, calcium or magnesium;

R is an alkyl radical of 1–12 carbon atoms or a cycloalkyl radical of 3–12 carbon atoms; and

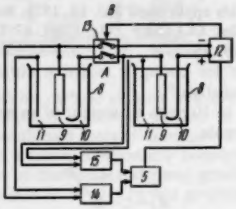
x is 1, 2, 3, 4 or 5,

the hydrophilic fluoropolymer having a sulfur plus phosphorus content of about 0.1–10% by weight, not more than about 1% by weight of the fluoropolymer dissolving in water at 20° C.

4,153,521
METHOD OF AUTOMATIC CONTROL AND OPTIMIZATION OF ELECTRODEPOSITION CONDITIONS

Rafael S. Litvak, ulitsa Kafanova-Titova, 8, kv. 103, Tashkent; Georgy G. Rannev, ulitsa Moskovskaya, 2, korpus 1, kv. 165, Krasnodar; Shulim A. Anash, Chilanzar, kvartal 14, 3, kv. 39; Larisa P. Kim, Chilanzar, 10 kvartal, 38, kv. 17, both of Tashkent; Alexandr I. Pen-Chen-Sek, ulitsa Furkata, 7-17; Gennady E. Borkov, ulitsa Gastello, 24-8, both of Almalyk Tashkentskoi oblasti; Anatoly E. Nikiforov, prospekt 50 let Oktyabrya, 13-24, Almalyk Tashkentskoi oblasti; Vladimir G. Shutchenko, ulitsa Ostrovskogo, 2, kv. 82, Chelyabinsk, and Mikhail M. Tabachnikov, ulitsa Sverdlova, 15, Tashkent, all of U.S.S.R.

Filed Aug. 5, 1977, Ser. No. 822,050
Int. Cl.[2] C25C *1/00, 7/06;* C25D *21/12*
U.S. Cl. 204—105 R **6 Claims**



1. A method of automatic control and optimization of technological conditions of electrodeposition of metal from electrolyte, comprising the steps of

a. electrolytically depositing a test deposit of metal from fresh electrolyte solution being supplied for use in the process, unto a first indicator electrode;

b. electrolytically depositing a test deposit of metal from foul electrolyte being removed from the electrolysis process and unto a second indicator electrode both said test deposit being formed with a predetermined direct current flowing for a predetermined period of time;

c. determining the difference in time for each test deposit to re-dissolve in its respective electrolyte as an index of the extent to which the foul electrolyte has been depleted of metal;

d. comparing the index of the extent of metal depletion with the amount of energy consumed in the process as an efficiency index of the relative efficiency of the process; and

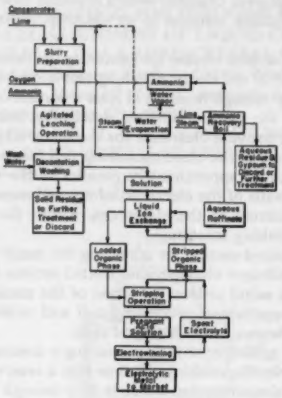
e. controlling electrolyte composition and temperature to maintain the efficiency index within predetermined limits.

4,153,522
SULFATE PRECIPITATION DURING OXIDATIVE AMMONIUM LEACH OF Cu, Ni, Zn SULFIDE ORES

Nathaniel Arbiter, Vail, and Benjamin D. Cooley, Tucson, both of Ariz., assignors to The Anaconda Company, New York, N.Y.

Continuation-in-part of Ser. No. 805,106, Jun. 9, 1977, abandoned, which is a continuation of Ser. No. 339,332, Mar. 8, 1973, abandoned. This application May 31, 1978, Ser. No. 911,159
Int. Cl.[2] C22B *15/10, 19/24, 23/04*
U.S. Cl. 204—106 **9 Claims**

1. In a process for recovering a metal of the group consisting of copper, zinc and nickel from an ore or concentrate containing such metal in the form of a sulfide mineral, wherein the ore or concentrate is subjected to a leaching operation by slurrying it in an aqueous solution containing sufficient ammonium sulfate and free ammonia to leach said metal sulfide from said ore or concentrate and vigorously agitating the resulting slurry at a temperature in the range from 50° C. to 100° C. and at near atmospheric pressure in the presence of oxygen while vigorously recirculating said oxygen from above the surface of said slurry to a substantial depth below such surface, resulting in oxidation of the metal sulfide to form a soluble metal ammonia sulfate complex, the improvement which comprises introducing sufficient alkaline earth metal hydroxide into the slurry prior to completion of the leaching operation to precipitate, as an insoluble sulfate, the amount of sulfur oxidized to sulfate in the leaching of the sulfide mineral, withdrawing from the leaching operation slurry containing metal ammonia complex dissolved in the aqueous phase and undissolved residue of the ore or concentrate plus precipitated alkaline earth metal sulfate

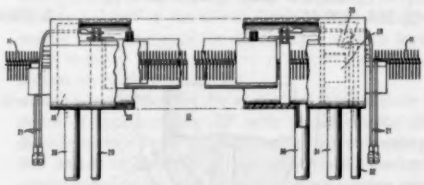


in the solid phase, separating said aqueous phase from said solid phase, introducing water into at least one of the leaching and aqueous-solids separation operations, recovering the metal from said aqueous phase, recycling a major portion of the residual metal barren aqueous phase containing ammonium sulfate and free ammonia to the leaching operation, without further treatment to remove sulfate in therefrom or regenerate ammonia therein, for making fresh ore or concentrate slurry for leaching, and treating the recycled portion prior to its return to the slurry preparation operation to eliminate water at a rate approximately equal to its rate of introduction.

4,153,523
CONTINUOUS ELECTROCHEMICAL PROCESSING APPARATUS

Donald E. Koontz, Summit, and Dennis R. Turner, Chatham Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 4, 1978, Ser. No. 902,896
Int. Cl.[2] C25F *3/16, 7/00;* C25D *5/02*
U.S. Cl. 204—129.6 **17 Claims**



1. An apparatus for continuous electrochemical processing on a continuous metallic strip using a plurality of processing steps carried out in a plurality of processing cells including an electropolishing processing cell, said electropolishing cell comprising a long narrow container comprising:

(a) means for making electrical contact to the metallic strip, said means comprising a stationary rectangular member generally rounded-off at the end and pressing against the metal strip line and two stationary round members located on the other side of the strip line and located before and after the stationary rectangular member, said rectangular and round members made of conducting material;

(b) a first slotted section for admitting metal strip into an entrance spill-over chamber, said slotted section being deep enough to admit at least a portion of the metal strip into the electropolishing processing cell and wide enough to provide clearance for the metal strip;

(c) a first spill-over chamber with a drainage tube to convey electropolishing solution to an electropolishing solution reservoir;

(d) a second slotted section for admitting the metal strip into a main part of the electropolishing cell said slotted section being deep enough to admit at least a portion of the metal strip into the electropolishing processing cell and wide enough to provide clearance for the metal strip;

(e) a main part of the electropolishing cell comprising electrodes located approximately parallel to the metal strip and side walls of the electropolishing cell means for conducting current to the electrodes, a tube for admitting electropolishing solution;

(f) a third slotted section for admitting the metal strip into a second spill-over chamber said slotted section being deep enough to admit at least a portion of the metal strip into the electropolishing processing cell and wide enoug to provide clearance for the metal strip;

(g) a second spill-over section containing a drainage tube for draining electropolishing solution into a reservoir;

(h) a fourth slotted section which is deep enough to admit at least a portion of the metal strip into the electropolishing processing cell and wide enough to provide clearance for the metal strip;

(i) a blow-off section with two gas nozzles located approximately symmetric on each side of the space provided for the metal strip said blow-off section provided with a drainage tube to convey electropolishing solution to a reservoir and passageways to convey gas to the gas nozzles said blow-off section equipped with deflection plates, one on each side and approximately parallel to the metal strip along its length and inclined inward toward the metal strip as the deflection plate extends downward; and

(j) a fifth slotted section which is deep enough to admit at least a portion of the metal strip into the electropolishing cell and wide enough to provide clearance for the metal strip.

4,153,524

METHOD OF ELECTROCHEMICAL MACHINING

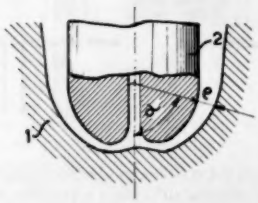
André Roche, Villars, and Charles Schepacz, Firminy, both of France, assignors to Centre Technique des Industries Mecaniques, Senlis, France

Filed Feb. 13, 1978, Ser. No. 877,109

Claims priority, application France, Feb. 24, 1977, 77 05450

Int. Cl.[2] B23P *1/00, 1/02, 1/16*

U.S. Cl. 204—129.43 **8 Claims**



1. A method of electrochemical machining, wherein a pulsating current comprising only positive half-waves separated by zero-current intervals is fed into an electrolyte between two electrodes in which the cathode is constituted by a tool and the anode is constituted by a part to be machined in accordance with the profile of the cathode, wherein the current is a pulsating current having a frequency within the range of 5 to 500 c/s and having a half-wave rectified sinusoidal waveform or a square waveform.

4,153,525

PROCESS FOR CURING IONIZING RADIATION-HIGHLY SENSITIVE RESIN COMPOSITION

Kunio Araki; Takashi Sasaki, both of Takasaki; Kiyoshi Tabei, Fujisawa, and Kazuo Goto, Takasaki, all of Japan, assignors to Nitto Boseki Co., Ltd.,, Fukushima and Japan Atomic Energy Research Institute, Tokyo, both of, Japan, part interest to each

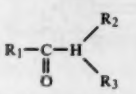
Continuation-in-part of Ser. No. 579,059, May 20, 1975, abandoned. This application Jul. 16, 1976, Ser. No. 705,921

Int. Cl.[2] C08F *2/54;* **C08L** *67/06*

U.S. Cl. 204—159.15 **10 Claims**

1. A process for curing a radiation curable composition consisting essentially of

(a) from 10.1 to 10 parts by weight of an amide represented by the formula



wherein R_1 is H, an alkyl group having from 1 to 17 carbon atoms or an alkenyl group having from 1 to 17 carbon atoms and each of R_2 and R_3 is independently —H, —CH_3 or —CH_2OH, and R_1 and R_2 taken together represent alkylene having from 2 to 5 carbon atoms, and

(b) 100 parts by weight of an unsaturated polyester resin, comprising irradiating the composition with a total dose of less than 10 Mrad of ionizing radiation.

4,153,526

LAMINATED WINDSHIELD WITH IMPROVED INNERLAYER

Joseph Cherenko, Valencia, and Charles W. Lewis, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 793,674, May 4, 1977, Pat. No. 4,109,055, which is a division of Ser. No. 682,538, May 3, 1976, Pat. No. 4,039,720. This application Mar. 3, 1978, Ser. No. 883,079

The portion of the term of the patent subsequent to Aug. 21, 1995, has been disclaimed.

Int. Cl.[2] C08G *2/02;* **B32B** *17/10, 27/42*

U.S. Cl. 204—159.21 **4 Claims**

1. A transparent polymer film for use as an innerlayer in a bilayer safety glass laminate which consists essentially of a saturated thermoplastic polyvinyl acetal and an effective amount of a photoinitiator capable of initiating crosslinking of said film upon exposure to actinic radiation.

4,153,527

MANUFACTURE OF CARBIDES AND THE LIKE

Herbert Greenewald, Jr., 4296 Braunton Rd., Columbus, Ohio 43220

Division of Ser. No. 667,691, Mar. 17, 1976, Pat. No. 4,080,508. This application Jan. 26, 1978, Ser. No. 872,422

Int. Cl.[2] B01K *1/00;* **C01B** *31/36*

U.S. Cl. 204—164 **3 Claims**

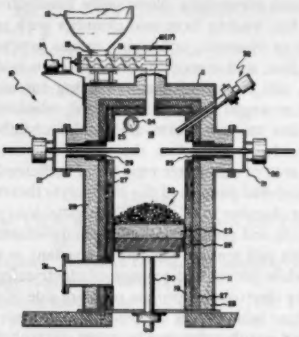
1. In a method of producing silicon carbide crystals, the steps of:

a. establishing an ionized atmosphere using electrically energized opposed electrodes projected interiorly of a graphite crucible;

b. injecting a mixture containing a finely-divided silica-like

ingredient and a finely-divided carbon-containing reductant ingredient into said crucible from above said ionized atmosphere;

c. reacting acid mixture ingredients during free-fall by gravity through said ionized atmosphere; and



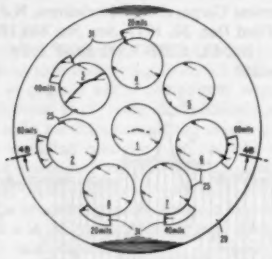
d. collecting silicon carbide crystals and the like from the free-fall reaction at a deposit surface in said crucible which is beneath said ionized atmosphere and which is maintained in a select, substantially constant temperature zone position in the furnace thermal gradient range extending from said electrodes to said graphite crucible.

4,153,528

CONTOURED QUARTZ ANODE PLATE

Robert H. Dykeman, and Man-Chong Wong, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,337
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 R **8 Claims**



1. In a sputter deposition system for coating workpieces with a layer of material, said system including, a low pressure ionization chamber containing an anode plate having recesses in its upper surface for supporting workpieces in a common plane, a cathode source of coating material, and a source of power for producing a glow discharge in a gas contained in said chamber, the improvement which comprises: A contoured anode plate which provides a thinner region of said plate at the edge of at least one recess and a substantially uniform but greater thickness directly under the workpieces so as to provide a more uniform coating layer of material on the workpieces.

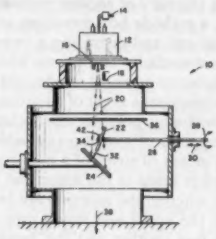
7. In a process for sputter coating workpieces with a layer of material in which the workpieces are supported in a common plane within recesses formed in an anode plate in a low pressure atmosphere of an ionizable gas and power is supplied to a cathode source of coating material to produce a glow discharge in said gas so that material is sputtered from the source onto the workpieces, the improvement which comprises providing the anode plate with a thinner region at the edge of at least one said recess while maintaining the thickness of the anode plate directly under said work pieces substantially constant and greater than said thinner region so as to provide a more uniform coating layer of material on the workpieces.

4,153,529

MEANS AND METHOD FOR INDUCING UNIFORM PARALLEL ALIGNMENT OF LIQUID CRYSTAL MATERIAL IN A LIQUID CRYSTAL CELL

Michael J. Little, Tarzana; Hugh L. Garvin, Malibu, and Yat-Shir Lee, Costa Mesa, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 21, 1975, Ser. No. 570,303
Int. Cl.[2] C23C *15/00*; G02F *1/13*
U.S. Cl. 204—192 EC **17 Claims**



1. A method for inducing uniform parallel alignment of liquid crystal material on a substrate surface for use in a liquid crystal cell comprising the steps of:

placing a coating, capable of being ion beam micromachined, over the substrate surface; and

exposing the substrate surface coating to a beam of space charge-neutralized ions directed at an angle to the surface coating for uniformly and microscopically scrubbing the coating and thereby for reproducibly inducing substantially parallel alignment of the liquid crystal material when in contact with the scrubbed surface coating.

14. A method for inducing parallel alignment of liquid crystal material for use in an alternating current liquid crystal light valve, comprising the steps of:

placing a substrate of silicon dioxide having a coating thereon of indium tin oxide for defining an electrode for the light valve in means for defining one of an ion beam deposition system and a radio frequency plasma sputtering system and for employing a source of argon ions;

suitably positioning a target of silicon dioxide and the substrate, and directing the argon ions at an energy of approximately 1–7 keV at the silicon dioxide target for approximately 27–30 minutes, for depositing a surface layer of approximately 2700 Angstroms of silicon dioxide on the indium tin oxide coating; and

directing a broad beam of the argon ions at an angular incidence of approximately 20° with respect to the silicon dioxide surface layer at an energy of approximately 2.5 keV and at an intensity of approximately 0.2 ma/cm^2 for approximately 6 minutes for selectively removing approximately 700 Angstroms of the silicon dioxide surface layer and for providing a surface condition sufficient for inducing parallel alignment of the liquid crystal material on the surface layer having the surface condition thereon when the liquid crystal material is subsequently placed in contact therewith.

4,153,530
DIAPHRAGM CELLS

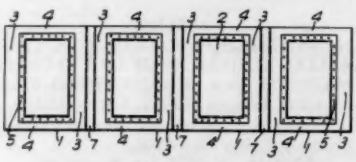
Christopher Vallance, and Peter J. Davies, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 20, 1978, Ser. No. 888,387

Claims priority, application United Kingdom, Apr. 13, 1977, 15280/77

Int. Cl.[2] C25B *9/00, 13/02, 13/08*

U.S. Cl. 204—252 **8 Claims**



1. An electrolytic diaphragm cell for the production of halogen, hydrogen and an alkali metal hydroxide solution by electrolysis of an aqueous alkali metal halide solution, which cell comprises a plurality of anodes vertically mounted at one side of the cell, a cathode box providing at least the opposite facing side of the cell and providing a cathode between adjacent anodes, a substantially continuous hydraulically permeable diaphragm between adjacent anodes and cathodes, wherein the diaphragm comprises a sheet of a porous non-melt-processable fluorine-containing polymer connected to an upper and lower slotted supports of a melt-processable fluorine-containing polymer by means of strips of a melt-processable fluorine-containing polymer fused to the upper and lower edges of the diaphragm, and wherein the supports are located in the cell so that the slots in the upper and lower supports are in vertical alignment with one another and the anodes extend into the space defined by the upper and lower supports and the diaphragm.

4,153,531
APPARATUS FOR ELECTROCHEMICALLY PROCESSING METALLIC SURFACES

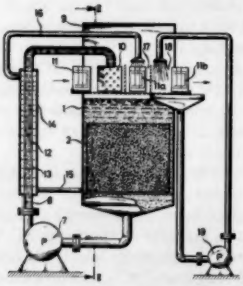
Wolfgang Faul, Jülich, and Bertel Kastening, Hamburg, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Division of Ser. No. 770,828, Feb. 22, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,638

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637745

Int. Cl.[2] C25D *17/06;* **C25F** *7/00*

U.S. Cl. 204—263 **5 Claims**



1. An apparatus for electrochemically treating metallic surfaces of workpieces arranged in a contact-free manner relative to the electrodes of an electrolytic cell, which includes: an electrolytic cell comprising an anode and a cathode, a diaphragm dividing said electrolytic cell into a first and a second chamber, one of said chambers having said anode and the other one of said chambers containing said cathode, a treatment chamber for receiving workpieces to be treated electrochemically in a contact-free manner with regard to said electrodes by an electrolyte comprising electrically conductive bodies, a conveying line leading from said chamber with said anode to said treatment chamber, conveying means interposed in said conveying line, said conveying line between said conveying means and said treatment chamber being surrounded by an outer pipe arranged in radially spaced relationship to said conveyed line so as to form an annular chamber with the outside of said conveying line, the wall of said conveying line, within the area of said outer pipe being sufficiently porous to permit unhindered passage of the electrolyte therethrough into said annular chamber to effect uniform metal ion concentration at the cathode and precluding hydrogen development simultaneously with cell tension remaining constant in said electrolytic cell while preventing passage of electrically conductive bodies in the electrolyte from the pressure side of said conveying means into said annular chamber, and conduit means leading from said annular chamber into said electrolyte cell chamber with said cathode, the electrolyte from said electrolytic cell chamber with said cathode being positively guided through said diaphragm provided in said electrolytic cell, said diaphragm thus being made free from said electrically conductive bodies eventually depositing upon its anode side of said diaphragm.

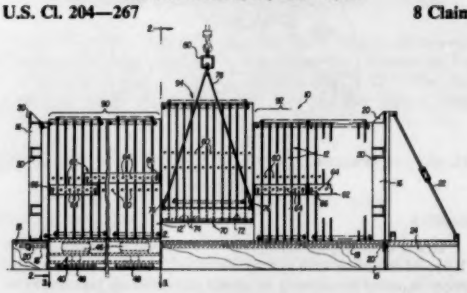
4,153,532
APPARATUS FOR DISASSEMBLY OF A PLURAL CELL ELECTROLYZER

Robert H. Fitch, Syracuse; Bruce E. Kurtz, Marcellus, both of N.Y., and Noel Y. Rothmayer, Madison, N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Dec. 30, 1977, Ser. No. 866,156

Int. Cl.[2] C25B *9/00;* **B66F** *3/24*

U.S. Cl. 204—267 **8 Claims**



1. A cell frame transfer cart for vertical and horizontal displacement of a segment of a plural cell electrolyzer comprising:

(a) a main platform;

(b) a secondary platform;

(c) vertical displacement means intermediate said main platform and said secondary platform comprising a plurality of air-actuated bladder members disposed in mutually overlapping sets, wherein the centerline of a first set passes at least tangent to the load-bearing area of the adjacent set; and,

(d) support means for supporting said main platform and for permitting horizontal displacement of a selected segment of a plural cell electrolyzer when said vertical displacement means are actuated.

4,153,533
SHALE CONVERSION PROCESS

Chalmer G. Kirkbride, 13 Elk Forest, R.D. #2, Elkton, Md. 21921

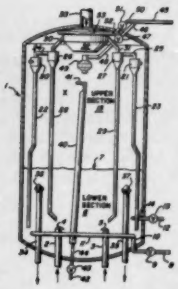
Filed Sep. 7, 1977, Ser. No. 831,171
Int. Cl.[2] C10B *53/06;* C10G *11/04*
U.S. Cl. 208—11 R 7 Claims

1. Process for recovering oleaginous products from oil shale which comprises drying oil shale particles to a free moisture content of less than 3.0% by weight, admixing the dried shale particles with hydrogen, and subjecting, at a temperature of less than 600° F., the shale-hydrogen mixture to microwave energy.

4,153,534
CATALYTIC CRACKING WITH REDUCED EMISSION OF NOXIOUS GASES

Iacovos A. Vasalos, Downers Grove, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 642,542, Dec. 19, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,556
Int. Cl.[2] C10G *11/02;* B01D *15/06;* B01J *29/06;* C01B *17/00*
U.S. Cl. 208—120 30 Claims



1. In a process for the cyclic, fluidized, catalytic cracking of hydrocarbon feedstock containing about 0.2 to about 6 weight percent sulfur as organic sulfur compounds wherein: (i) said feedstock is subjected to cracking in a reaction zone in contact with fluidized solid particles comprising cracking catalyst; (ii) solid particles including catalytic particles which are deactivated by sulfur-containing carbonaceous deposits, are separated from reaction zone effluent and pass to a stripping zone wherein volatile deposits are removed from said solid particles by contact with a stripping gas; (iii) stripped, solid particles are separated from stripping zone effluent and pass to a catalyst regeneration zone and non-stripped, sulfur-containing, carbonaceous deposits are removed from the stripped, solid particles by burning with an oxygen-containing gas thereby forming sulfur oxides; and (iv) resulting solid particles are separated from regeneration zone effluent gas and recycled to the reaction zone; a method for reducing emissions of sulfur oxides in the regeneration zone effluent gas which comprises:

(a) cracking said feedstock at a temperature from about 850° to about 1,200° F. in the presence of said solid particles comprising a molecular sieve-type cracking catalyst and at least one metallic reactant in the same or different ones of said solid particles, said metallic reactant consisting essentially of one or more members selected from the group consisting of sodium, scandium, titanium, chromium, molybdenum, manganese, cobalt, nickel, antimony, copper, zinc, cadmium, the rare earth metals and lead, in free or combined form, and wherein said metallic reactant is present in said solid particles in sufficient amount to effect the absorption of at least about 50 weight percent of the sulfur oxides produced by said burning of sulfur-containing carbonaceous deposits in the regeneration zone;

(b) stripping volatile deposits from said solid particles at a temperature from about 850° to about 1,200° F. with a stripping gas which contains steam, wherein the ratio by weight of steam to said molecular sieve-type cracking catalyst is from about 0.0005 to about 0.025, said stripping being conducted at a temperature and with steam such that passage of said solid particles through said cracking and stripping zones provides said metallic reactant in an amount and active form suitable for accomplishing said absorption of at least about 50 weight percent of the sulfur oxides produced by said burning in said regeneration zone;

(c) passing to the regeneration zone stripped, solid particles having said metallic reactant in an active form for absorbing at least about 50 weight percent of said sulfur oxides in said regeneration zone;

(d) burning in said regeneration zone said sulfur-containing carbonaceous deposits from the stripped, solid particles at a temperature from about 1,050° to about 1,450° F. said burning being conducted at a temperature and with oxygen containing gas having molecular oxygen such that at least about 50 weight percent of the sulfur oxides produced by said burning in said regeneration zone can be absorbed by said metallic reactant;

(e) absorbing with the solid particles at least about 50 weight percent of the sulfur oxides produced by said burning of sulfur-containing carbonaceous deposits in the regeneration zone;

(f) passing to the reaction zone said solid particles having absorbed therein at least about 50 weight percent of the sulfur oxides produced by said burning;

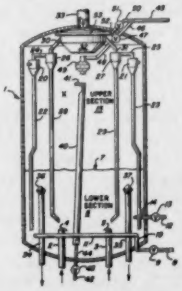
(g) withdrawing an effluent gas from the regeneration zone containing molecular oxygen and having a low concentration of sulfur oxides of less than about 600 ppmv; and

(h) substantially converting said absorbed sulfur oxides to sulfur-containing gas in said reaction and/or stripping zone.

4,153,535
CATALYTIC CRACKING WITH REDUCED EMISSION OF NOXIOUS GASES

Iacovos A. Vasalos; William D. Ford, both of Downers Grove, and Chuan-Kang R. Hsieh, Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 642,545, Dec. 19, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,555
Int. Cl.[2] C10G *11/02;* B01D *15/06;* B01J *29/06;* C01B *17/00*
U.S. Cl. 208—120 35 Claims



1. In a process for the cyclic, fluidized, catalytic cracking of hydrocarbon feedstock containing about 0.2 to about 6 weight percent sulfur as organic sulfur compounds wherein (i) said feedstock is subjected to cracking in a reaction zone in contact with fluidized solid particles comprising molecular sieve-type cracking catalyst; (ii) solid particles including catalytic particles which are deactivated by sulfur-containing carbonaceous deposits, are separated from reaction zone effluent and pass to a stripping zone wherein volatile deposits are removed from

said solid particles by contact with a stripping gas; (iii) stripped, solid particles are separated from stripping zone effluent and pass to a catalyst regeneration zone and are regenerated by burning the non-stripped, sulfur-containing, carbonaceous deposits from the stripped, solid particles with an oxygen-containing gas thereby froming sulfur oxides; and (iv) resulting solid particles are separated from regeneration zone effluent gas and recycled to the reaction zone; a method for reducing emissions of carbon monoxide and sulfur oxides in the regeneration zone effluent gas which comprises:

(a) circulating through the process cycle said solid particles comprising said catalyst and at least one metallic reactant in the same or different ones of said solid particles, which metallic reactant reacts with sulfur oxides in the regeneration zone, said metallic reactant consisting essentially of one or more members selected from the group consisting of sodium, magnesium, calcium, strontium, barium, scandium, titanium, chromium, molybdenum, manganese, cobalt, nickel, antimony, copper, zinc, cadmium, lead, and the rare earth metals, in free or combined form;

(b) cracking said feedstock at a temperature from about 850° to about 1,200° F. and in contact with said cracking catalyst and said metallic reactant;

(c) stripping volatile deposits from said solid particles at a temperature from about 850° to about 1,200° F. with a stripping gas which contains steam, wherein the ratio by weight of steam to said catalyst is from about 0.0005 to about 0.025;

(d) burning in said regeneration zone said sulfur-containing carbonaceous deposits from the stripped, solid particles at a temperature from about 1,050° to about 1,450° F.;

(e) withdrawing from said regeneration zone an effluent gas containing molecular oxygen;

the improvement which comprises conducting said burning of the sulfur-containing carbonaceous deposits from the stripped, solid particles in the presence of at least one metallic promoter consisting essentially of one or more members selected from the group consisting of ruthenium, rhodium, palladium, osmium, iridium, platinum, vanadium, tungsten, uranium, zirconium, rhenium, and silver, in free or combined form, wherein the metallic promoter and the metallic reactant are present during said catalyst regeneration in sufficient amounts to effect absorption by said metallic reactant of at least about 50 weight percent of the sulfur oxides produced by said burning in said regeneration zone, and wherein the metallic promoter is present in sufficient amount to enhance said absorption of sulfur oxides and the conversion of carbon monoxide to carbon dioxide in the regeneration zone; said burning being conducted at a temperature and with oxygen-containing gas having molecular oxygen such that at least about 50 weight percent of the sulfur oxides produced by said burning in said regeneration zone can be absorbed by said metallic reactant; said solid particles recycled to the reaction zone having absorbed therein at least about 50 weight percent of said sulfur oxides produced in said regeneration zone; said stripped, solid particles passing to said regeneration zone having said metallic reactant in an active form for absorbing at least about 50 weight percent of said sulfur oxides produced in said regeneration zone; said stripping being conducted at a temperature and with steam such that passage of said solid particles through said cracking and stripping zones provides said metallic reactant in an amount and active form suitable for accomplishing said absorption of at least about 50 weight percent of said sulfur oxides produced in said regeneration zone; said effluent gas from said regeneration zone having a low concentration of sulfur oxides of less than about 600 ppmv; and substantially converting said absorbed sulfur oxides to sulfur-containing gas in said reaction and/or stripping zone.

4,153,536

CRACKING WITH CATALYST MODIFIED BY ANTIMONY THIOPHOSPHATE

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 768,001, Feb. 11, 1977, Pat. No. 4,111,845. This application Jun. 1, 1978, Ser. No. 911,581

Int. Cl.[2] **C10G** *11/06;* **B01J** *8/24, 23/18*

U.S. Cl. 208—120 **13 Claims**

1. A hydrocarbon cracking process comprising contacting a hydrocarbon feedstock in a cracking zone under cracking conditions essentially in the absence of added hydrogen in the presence of a cracking catalyst at least a portion of which is a cracking catalyst consisting essentially of an unused catalytic cracking material useful for cracking of hydrocarbons in the absence of added hydrogen, said material containing less than about 40 wt. % zeolite and antimony in an amount sufficient to inhibit detrimental effect of contaminant materials when said cracking catalyst is employed in a hydrocarbon cracking process, wherein said antimony is derived from an antimony tris (0,0-dihydrocarbyl dithiophosphate), and thereafter withdrawing cracked hydrocarbons from said cracking zone as the product of the process.

4,153,537

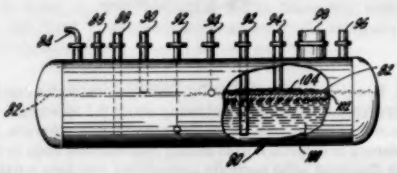
CRYOTHERMAL MANIPULATION OF PETROLEUM

Sigmund L. Ross, 1280 E. 53rd St., Brooklyn, N.Y. 11234; Oscar Shuffman, deceased, late of Scarsdale, N.Y., and by Rose Shuffman, executrix, 1 Cornell St., Scarsdale, N.Y. 10583

Division of Ser. No. 762,657, Jan. 26, 1977, which is a division of Ser. No. 246,960, Apr. 24, 1972, Pat. No. 4,031,707. This application Jun. 23, 1978, Ser. No. 918,586

Int. Cl.[2] **C10G** *31/08* **C10G** *31/06;* **C10G** *33/00*

U.S. Cl. 208—177 **4 Claims**



1. A method for pre-refining a body of crude petroleum comprising the steps of:

introducing crude petroleum and water into a container;

introducing in said container a mass of material which is at a cryothermal temperature corresponding to the freezing point of water at sea level or lower, the cryothermal temperature of said material is lower than the temperature of said petroleum and water so as to cause freezing of said water and an increase in the surface tension of said crude petroleum thereby resulting in the expulsion of foreign matter from said petroleum to said water to produce pre-refined petroleum; and

removing the pre-refined petroleum from the container.

4,153,538

USE OF DEASHED COAL AS A FLUSHING AGENT IN A COAL DEASHING PROCESS

Robert E. Leonard, and Donald E. Rhodes, both of Oklahoma City, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

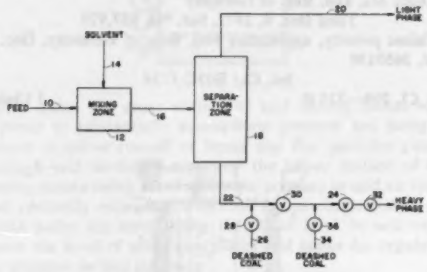
Filed Mar. 20, 1978, Ser. No. 888,299

Int. Cl.[2] **C10G** *21/14*

U.S. Cl. 208—177 **6 Claims**

1. A process for maintaining the fluid-like properties of a heavy phase withdrawn through a withdrawal conduit from a separation zone in a coal deashing process, said separation zone

being maintained at elevated temperature and pressure to effect a separation of a feed mixture comprising soluble coal products, insoluble coal products and solvent, said solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from



about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms, and phenols containing from about 6–9 carbon atoms and their homologs, said feed mixture being separated in said separation zone into a light phase and said heavy phase, which comprises:

(a) introducing a fluid substance into said withdrawal conduit during periods in which flow of said heavy phase through said conduit is interrupted due to conduit blockage by solids formed from said heavy phase to mix with said solids therein to form a mixture that exhibits fluid-like characteristics; and

(b) discharging said mixture formed in step (a) through said withdrawal conduit without the necessity of depressurizing and cooling of said separation zone.

4,153,539

PROCESS FOR PREPARING IMPROVED AMPHORA AGGREGATES

Daniel R. Herrington, Chesterland, and Albert P. Schwerko, Solon, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 3, 1978, Ser. No. 866,450
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—216 R **18 Claims**

1. In a process for hydrotreating a hydrocarbon feed stock, which contains compounds with carbon-sulfur bonds, carbon-nitrogen bonds, and carbon-oxygen bonds, by contacting the hydrocarbon feed stock with hydrogen at an elevated temperature and with a hydrotreating catalyst to remove sulfur, nitrogen and oxygen from the hydrocarbon feed stock, the improvement comprising using as at least part of said catalyst an amphora catalyst having a substantially spherical shape, a void center therein, a first cavity in the external surface communicating with the void center, and a second cavity 180° from said first cavity communicating with said void center, said amphora catalyst being prepared by:

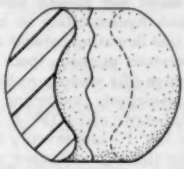
(a) preparing a slurry, the slurry comprising a suspending liquid and distinct particles of a first solid suspended in said liquid;

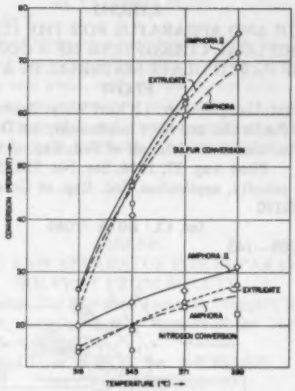
(b) preparing a particle bed consisting of particles of a second solid;

(c) forming droplets of said slurry;

(d) dropping said droplets of the slurry onto said particle bed in such a manner that the droplets are not immersed in the particle bed;

(e) freezing said droplets on said particle bed to enhance the rate of drying on the external surface of the slurry droplets





and to retard the rate of drying in the interior of the slurry droplets, and

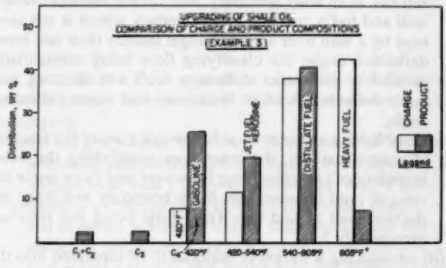
(f) removing at least part of said suspending liquid from said frozen droplets in said particle bed to form said amphora catalyst.

4,153,540

UPGRADING SHALE OIL

Robert L. Gorring, Washington Crossing, Pa., and Robert L. Smith, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,706
Int. Cl.[2] C10G *23/04*
U.S. Cl. 208—89 **8 Claims**



1. In a process for upgrading full range shale oil derived by retorting oil shale which process is conducted by contacting said full range shale oil in the presence of hydrogen with a composite dewaxing catalyst comprising a metal and a crystalline zeolite consisting essentially of one having a silica/alumina

ratio greater than 12 and a constraint index of about 1 to 12, the improvement which comprises:

contacting said full range shale oil in admixture with hydrogen with a hydrotreating catalyst at hydrotreating conditions to convert organic compounds of sulfur, nitrogen, oxygen and metal and passing substantially the entire effluent of such hydrotreating in cascade fashion into contact with said dewaxing catalyst at conversion conditions of temperature, pressure, space velocity and hydrogen concentration of a severity to hydrodewax the shale oil while simultaneously converting at least 50% of the shale oil boiling above about 750° F. to reaction products boiling below 750° F.; said severity including a temperature of 750° to 1000° F. and space velocity of 0.25 to 1 volumes of said shale oil per volume of catalyst per hour.

4,153,541

METHOD AND APPARATUS FOR THE CONTINUOUS CENTRIFUGAL CLASSIFYING OF A CONTINUOUS FLOW OF PARTICULATE MATERIAL IN A DEFLECTED FLOW

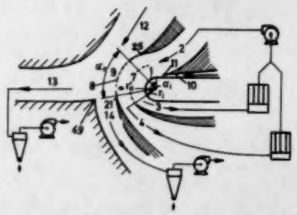
Hans Rumpf, Hansjakobstr. 12; Karl Maly, Bachstrasse 46, both of 7500 Karlsruhe, and Kurt Leschonski, Am Dammgraben 20, 3392 Clausthal-Zellerfeld, all of Fed. Rep. of Germany

Filed Aug. 27, 1976, Ser. No. 718,158

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1975, 2538190

Int. Cl.[2] B07B *7/086*

U.S. Cl. 209—143 **37 Claims**



1. A method of continuous centrifugal classifying of a continuous stream of particulate material into at least one fraction of coarse material and at least one fraction of fine material in a deflected flow, the material to be classified being classified in a gaseous fluid at cut-off sizes between approximately 1 μm and 100 μm and a mass flow ratio up to 10, between the supplied stream of material and a classifying gas flow, and being classified in a liquid fluid at cut-off sizes between approximately 10 μm and 1 μm, comprising:

(a) providing a curved inner deflection wall curved from a beginning over an inner deflection angle greater than 45°;

(b) establishing a classifying fluid flow which is deflected in a classifying region by said curved inner deflection wall and has, as an inner boundary, said curved inner deflection wall and has a curved outer boundary which is not covered by a wall over an outer angle smaller than said inner deflection angle, the classifying flow being substantially parallel to said inner deflection wall and abutting said inner deflection wall at least over said inner deflection angle;

(c) establishing an outer flow for carrying away the fraction of coarse material, the outer flow establishing the outer boundary of said classifying flow over said outer angle the ratio of radii between said outer boundary and inner deflection wall of said classifying flow being less than approximately 5:1;

(d) introducing a stream of material to be separated into the classifying flow in a thin layer in the vicinity of the beginning of curvature of the inner deflection wall in a direction such that the vector component of its velocity in the direction of the classifying flow is at least half the value of the velocity of the classifying flow and in a direction which does not deviate more than 45° from the direction of the classifying flow, whereby fine material, after being fanned out by centrifugal force is discharged primarily with the out-flowing classifying flow, and the coarse material passes through said outer boundary of the classifying flow which is not covered and is discharged primarily with the outer flow.

4,153,542

HIGH INTENSITY MAGNETIC SEPARATOR FOR THE WET PREPARATION OF MAGNETIZABLE PARTICLES OF SOLIDS

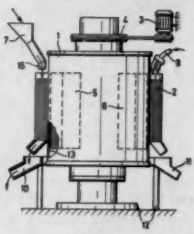
Hans Bender, Leverkusen; Wolf Zabel, Seelscheid; Gottfried Duren, and Karl-Heinz Unkelbach, both of Cologne, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Dec. 6, 1977, Ser. No. 857,975

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1976, 2655139

Int. Cl.[2] B03C *1/14*

U.S. Cl. 209—223 R **3 Claims**



1. A high-intensity magnetic field separator for magnetizable particles in a carrier medium forming a slurry, comprising:

a hollow non-magnetic body mounted for rotation about a vertical axis and including an outer wall;

means for rotating said body;

a matrix of ferromagnetic material mounted on the outer surface of said outer wall;

feed means for feeding the slurry through said matrix;

a magnetic system fixedly mounted within said hollow body close to said outer wall to be stationary with respect thereto, said magnetic system being constructed as an open magnetic system and being curved complemental to the curvature defined by the rotating outer wall and operable to establish a high-intensity magnetic field which closes upon itself through said outer wall and through the path of rotation of said matrix;

said matrix, when in the magnetic field, attracting the magnetizable particles and permitting the waste to flow through; and

means for removing the attracted particles from said matrix.

4,153,543

FRACTIONATING APPARATUS

Bengt G. Janson, 31 Woodbridge Ter., South Hadley, Mass. 01075

Filed Nov. 29, 1977, Ser. No. 855,619

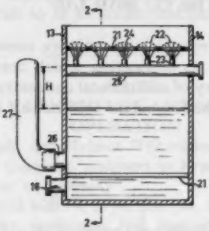
Claims priority, application Sweden, Nov. 30, 1976, 7613410

Int. Cl.[2] B07B *1/04*

U.S. Cl. 209—250 **5 Claims**

1. A fractionating apparatus for separating fine particles for coarse particles suspended in a liquid containing air comprising: a vessel having internally an upper air space communicating with a lower liquid space and being closed except for a top opening communicating with said air space and except for a liquid outlet communicating only with said liquid space; a spray nozzle located in said vessel and directed upwardly toward said top opening; means for supplying a suspension of

fine and coarse particles in a liquid containing air to said nozzle whereby said nozzle discharges the suspension through said air space toward said top opening and causes air to be released from the suspension into said air space; horizontally arranged sieving means extending across said top opening for passing released air and a portion of the sprayed liquid and fine particles to the upper surface of said sieving means and for deflecting the remainder of the liquid and the coarse particles into said



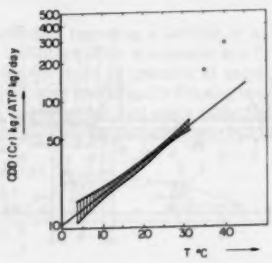
liquid space, the upper surface of said sieving means being exposed to substantially atmospheric pressure and being arranged to allow run-off of liquid and fine particles passing through said sieving means, and the lower surface of said sieving means being acted on by the pressure in said air space; and vertically adjustable overflow means connected to said liquid outlet for maintaining the liquid level in said vessel above the level of said liquid outlet and hence for regulating the pressure in said air space.

4,153,544

METHOD OF TREATING ORGANIC WASTE WATER

Katsuto Okada, Tokyo; Hideo Yamamoto, Machida; Susumu Teraguchi, Tama, and Norio Ishibashi, Tokyo, all of Japan, assignors to Marinaga Engineering Co. Ltd., Tokyo, Japan

Filed Aug. 18, 1977, Ser. No. 825,847
Claims priority, application Japan, Aug. 18, 1976, 51-98463
Int. Cl.² C02C *1/06*
U.S. Cl. 210—12 **3 Claims**



1. In a method of treating organic waste water containing large amounts of nitrogenous substituents by prolonged aeration in an aeration tank in which oxidation, nitrification and denitrification occur in the same aeration tank, the improvement wherein:

almost no excess sludge is produced and the COD (Cr) and nitrogen content of the treated waste water is largely decreased. by:

(1) adjusting the dissolved oxygen content in the aeration tank to be within the range of 1.5–4.5 ppm;

(2) controlling the temperature of the waste water to be within the range of 15°–40° C. and maintaining the residence time of the waste water in the aeration tank at ten or more days; and

(3) keeping constant the activated sludge content in the aeration tank by controlling the amount of COD(Cr) to be removed according to the equation:

$$\sigma T = 33.5 \times 1.058^{(T-20)}$$

wherein T is a temperature (°C.) of the waste water to be treated, and σT is COD(Cr) to be removed (Kg)/ATP content in the aeration tank (Kg)/day at T° C.

4,153,545

METHOD FOR CLEANING MEMBRANE FILTER

Robert R. Zwack, New Kensington, and Roger M. Christenson, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 18, 1977, Ser. No. 825,734
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 F **10 Claims**

1. A method of cleaning a membrane which has been used for filtering under pressure a cataphoretic paint and which has been fouled by said paint, said method comprising:

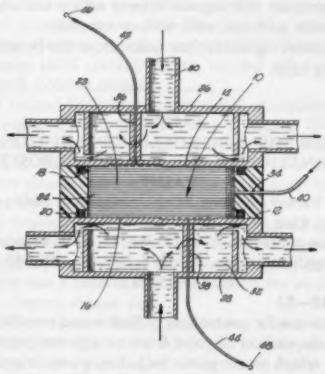
(A) contacting said membrane with an aqueous solution of an acid, a fatty amine and a water-soluble organic solvent for a period of time sufficient to clean said membrane.

4,153,546

METHOD AND APPARATUS FOR SEPARATING SOLVENT FROM SOLUTE

Harold T. Hammel, Del Mar, and James E. Maggert, San Diego, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 16, 1977, Ser. No. 851,918
Int. Cl.² B01D *17/00*
U.S. Cl. 210—41 **33 Claims**



1. A method for the separation of volatile solvent from a solution of said solvent and a relatively non-volatile solute, comprising:

infiltrating with said solution a matrix material capable of absorbing said solvent and having pores and gas entrained therein to at least 1% by volume of said matrix material;

providing a temperature difference across said matrix material to define hotter and cooler sides thereof and having a sufficient magnitude to obtain solution concentrated with said solute adjacent said hotter side and solution diluted with said solvent adjacent said cooler side, said matrix material substantially occupying the region between said hotter and cooler sides;

removing concentrated solution from said hotter side; and

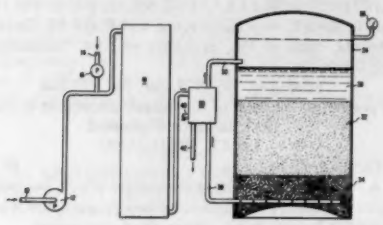
removing diluted solution from said cooler side.

4,153,547

USE OF ACIDIFIED COPPER SULFATE IN HYDROGEN SULFIDE REMOVAL

John O. McLean, Box 288-A, Rte. 14, Richmond, Va. 23231

Filed Feb. 6, 1978, Ser. No. 875,635
Int. Cl.[2] C02B *1/10*
U.S. Cl. 210—48 6 Claims



1. A method of treating well water for purposes of removing hydrogen sulfide from said well water comprising the steps of

(a) conducting sulfur-containing water from a well,

(b) acidifying a treating solution of copper sulfate to a maximum pH of 4 to prevent premature precipitation of copper hydroxide and introducing at least a slight excess of said acidified copper sulfate into said water,

(c) delivering said water and acidified copper sulfate in a non-aerated system into a treating tank atop a treating filter of neutralizing mineral,

(d) forming copper sulfide and precipitating same from said water,

(e) forming copper hydroxide in said tank above or within said neutralizing mineral from the excess of said acidified copper sulfate,

(f) mechanically filtering said copper sulfide and said copper hydroxide with said neutralizing mineral,

(g) and removing sulfur-free water from the bottom of said treating tank.

4,153,548

PROCESS FOR CONTROLLING POLLUTION AND CONTAMINATION IN THE ELECTRODEPOSITION OF PAINT

Steven W. Forney, Wixom, Mich., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 436,625, Jan. 25, 1974, abandoned. This application Jun. 27, 1975, Ser. No. 590,959
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—52 6 Claims

1. In a process for controlling pollution and contamination in the electrodeposition of paint from an aqueous paint bath on articles in which waste water including paint drippings from such articles and water used to wash said articles after they have been painted contains negatively charged paint solids which are tacky, the improvement which consists essentially of adding to said waste water a quantity of an acidic anionic silica sol and a water dispersible coagulating anionic or non-ionic polymer sufficient to reduce the tackiness of the paint solids in said waste water and sufficient to condition said solids so that they can be separated from said water, said water dispersible polymer having an average molecular weight of at least 5000 and having a linear carbon chain to which is attached a plurality of groups selected from the group consisting of anionic groups and non-ionic groups, the proportions of said silica sol corresponding to 500 to 2000 parts by weight of a silica sol containing 30% to 50% by weight SiO_2 per million parts of said waste water and the proportions of said polymer corresponding to 0.5 to 15 parts by weight per million parts of said waste water, and separating said solids from the water.

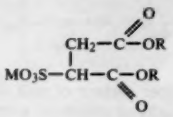
4,153,549

SODIUM DIALKYL SULFOSUCCINATES AS DEWATERING AIDS IN THE FILTRATION OF MINERAL CONCENTRATES

Samuel S. Wang, Cheshire, and Morris E. Lewellyn, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 20, 1977, Ser. No. 817,409
Int. Cl.[2] B01D *5/00*
U.S. Cl. 210—54 4 Claims

1. A process for reducing the moisture content of mineral concentrates subject to dewatering which comprises mixing with an aqueous slurry of said mineral concentrate an effective amount of a dialkylsulfosuccinic acid or salt thereof of the formula:



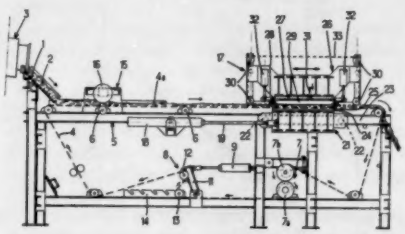
wherein M is a hydrogen, alkali metal, or ammonium cation and R is an alkyl group of about 10 to 24 carbon atoms, dewatering the thus-treated slurry, and substantially retaining upon said dewatered mineral concentrate said dialkylsulfosuccinic acid or salt.

4,153,550

METHOD AND APPARATUS FOR THE CONTINUOUS FILTRATION OF MATERIAL IMPREGNATED WITH LIQUID

Jean-Claude Lautrette, Ville D'Avray, France, assignor to Societe Nouvelle des Filtres Philippe, Saint-Cloud, France

Filed Dec. 19, 1977, Ser. No. 862,162
Claims priority, application France, Dec. 21, 1976, 76 38473
Int. Cl.[2] B01D *33/04*
U.S. Cl. 210—66 15 Claims



1. Apparatus for the continuous filtration of material impregnated with liquid, which comprises:

a conveyor belt for carrying out a continuous movement and on which said material is deposited;

a press including a first chassis exerting its action on said material deposited on the conveyor belt in order to expel the liquid contained in the latter;

an endless canvass connected to said first chassis of said press;

means for passing said endless canvass between said first chassis and said material; and,

shifting means for imparting to said press a cyclic movement comprising, in a first stage, the application of pressure to the material impregnated with liquid and the movement of the press in synchronism with the belt and, in a second stage, the release of the pressure and the return of the press to its starting point.

12. A method for continuous filtration of material impregnated with liquid including a press member having a first

chassis and an inflatable air chamber, an endless canvass surrounding said first chassis and a conveyor belt comprising:

depositing material to be filtered on said conveyor belt;

continuously moving said conveyor belt;

shifting said upper chassis of said press so as to exert pressure discontinuously on successive portions of said material deposited on said continuously moving conveyor belt;

inflating said air chamber; and,

passing said endless canvass between said first chassis and said material so as to isolate said air chamber from said material.

4,153,551
WOBBLE CENTRIFUGE AND METHOD OF OPERATION

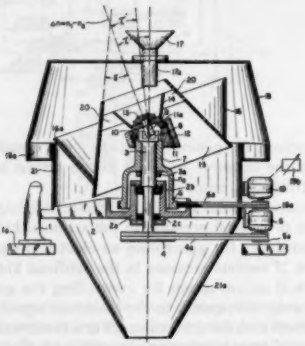
Günther Hultsch, and Helmut Wilkesmann, both of Munich, Fed. Rep. of Germany, assignors to Krauss-Maffei AG, Munich, Fed. Rep. of Germany

Filed Mar. 7, 1978, Ser. No. 884,162

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710586

Int. Cl.² B01D *33/02*

U.S. Cl. 210—78 **2 Claims**



1. A method of operating a wobble or nutating centrifuge wherein a centrifuge drum is rotatable at a first speed n_1 and a tilt guide for the drum is rotatable at another speed n_2, said method comprising centrifugally filtering material in said drum by driving said drum and said guide at the respective speeds n_1 and n_2 while maintaining the ratio n_2/n_1 in one of the following ranges:

(a) 0.1 to 0.85

(b) at 0.95

(c) 1.05 to 1.9

(d) 2.1 to 5

(e) 0 to −5

thereby getting an effective nutating angle which differs from the structurally defined nutating angle

$$\tau' = \left[1-(1-\frac{n_2}{n_1})^2\right]\cdot\tau.$$

4,153,552
METHOD FOR REGENERATING FILTERS

Richard M. Muther, Lakewood, Colo., assignor to Environmental Industrial Products, Denver, Colo.

Filed Aug. 5, 1977, Ser. No. 822,133

Int. Cl.² B01D *23/24*

U.S. Cl. 210—82 **11 Claims**

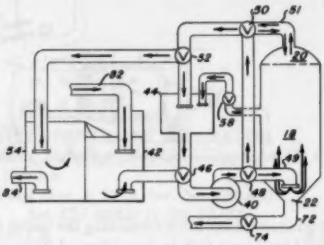
1. A method for use in a liquid type filter vessel having at least one filter tube for regenerating the filter cake medium on the filter tube within the vessel, said filter cake formed by introducing a suspension of a liquid and small particles of filter material into said vessel so that when the liquid passes through the filter tube in a forward flow direction, the filter material will be deposited thereon to provide the filter medium for a continuous liquid filtering process, the regenerating method comprising the steps of

(a) reversing the flow of a sufficient quantity of liquid through the filter tube for a sufficient time to dislodge the filter cake and retained solids from the filter tube;

(b) causing the liquid within the vessel to move in a cyclic forward and reverse flow direction within the vessel to break up the filter cake formed by the particles of filter material and mix the particles and the retained solids to form a homogeneous liquidized suspension within the vessel; and

(c) redepositing the mixture of the filter material and retained solids on the surface of the filter tube in order that the regenerated filter cake will be homogeneous throughout its thickness and will have a clean filter surface to improve the efficiency of the liquid filtering process.

11. A filter system for liquids comprising a filter regeneration system, said filter regeneration system comprising:



(a) first and second path means;

(b) said first path means comprising in sequence:

pump means, first conduit means, first valve means, second conduit means, first filter housing nozzle means, filter element means, second filter housing nozzle means, third conduit means, second valve means, and fourth conduit means;

(c) said second path means comprising in sequence:

said pump means, said first valve means, fifth conduit means, said second valve means, said third conduit means, said second filter housing nozzle means, said filter element means, third filter housing nozzle means, and sixth conduit means; and

(d) said regeneration system further comprising means to alternate flow between said first and second path means in a frequency and duration sufficient to liquify and homogeneously mix a filter cake which was on the surface of said filter element means; and

(e) said filter system further comprising means to redeposit said liquified filter cake upon the surface of said filter element means as a single homogeneous layer.

4,153,553
APPARATUS FOR AND METHOD OF RECLAIMING AND CLEANING OIL FROM BOTTOM SETTLINGS OF TANKS

Larry R. Davis, Rte. 3, Box 616, Wichita Falls, Tex. 76308

Filed Sep. 29, 1977, Ser. No. 837,993

Int. Cl.² B01D *21/10*

U.S. Cl. 210—95 **5 Claims**

1. An apparatus for removing BS from the bottom of an oil storage tank, cleaning the oil storage tank and for separating oil and water from the BS, which oil storage tank has an inlet opening and an outlet opening formed therein, which apparatus comprises;

(a) a frame,

(b) a BS treatment tank, having at least two inlet openings

and an outlet opening formed therein, mounted on said frame,

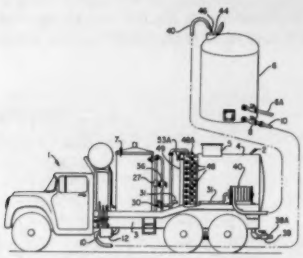
(1) conduit means in fluid communication between said oil storage tank and the BS treatment tank,

(2) a first power driven reversible pump connected to said conduit means to withdraw BS from the oil storage tank and to direct the BS into said treatment tank,

(c) a coil having an inlet opening and an outlet opening formed therein, mounted on said frame and having the inlet opening thereof in fluid communication with said outlet opening of said BS treatment tank,

(1) a burner means mounted on said frame in position to heat said coil,

(2) a second power driven reversible pump, of lesser capacity than said first power driven reversible pump, attached to the outlet of said BS treatment tank and to the inlet of said coil for circulating the BS through the coil,



(3) conduit means interconnecting the outlet of said coil to said treatment tank to direct heated BS to an inlet in said BS treatment tank,

(4) said BS treatment tank having an opening formed therein to permit chemicals to be directed into the treatment tank,

(5) time, chemicals and heat cause the separation of the oil and water from the BS, which oil and water form an interface,

(6) a sight glass on said BS treatment tank through which to observe the interface of the separated oil and water,

(7) said conduit means interconnecting said BS treatment tank and said oil storage tank provides a conduit through which cleaned, separated oil is returned, by said reversible pump, to said oil storage tank,

(8) an outlet conduit in said BS treatment tank to direct the water from said BS treatment tank to a place of disposal.

4,153,554

APPARATUS FOR USE IN ARTIFICIAL KIDNEY SYSTEM

Jack von der Heide, Arlington; Robert J. Edelman, and Murray R. McLeod, both of Dallas, all of Tex., assignors to American Micro-Bionics Corp., Garland, Tex.

Filed Feb. 22, 1977, Ser. No. 770,789

Int. Cl.[2] B01D *13/00, 31/00*

U.S. Cl. 210—96 M **14 Claims**

1. An apparatus for delivering a dialysate solution to an artifical kidney device comprising:

a hydraulics circuit, the hydraulics circuit having a water supply branch, a dialysate solution supply branch extending from the junction of the water supply branch and the dialysate concentrate supply branch to a port for supplying dialysate solution to an artifical kidney, and a return branch extending from a port through which dialysate solution returns from the artifical kidney to a drain line for passing used dialysate solution out of the hydraulics circuit;

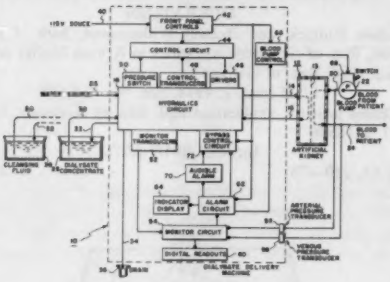
a supply pump disposed in the water supply branch for pumping water into the dialysate solution supply branch at a controlled rate;

means for controllably heating water flowing in the water supply branch;

means downstream from the heating means for deaerating water flowing in the water supply branch;

a concentrate pump disposed in the dialysate concentrate supply branch for pumping dialysate concentrate into the dialysate solution supply branch at a controlled rate;

a return pump disposed in the return branch for drawing effluent dialysate solution from the artifical kidney and pumping the solution out through the drain line;



a first transducer for generating an electrical signal representative of the negative pressure in the return branch upstream from the return pump;

a second transducer for generating an electrical signal representative of arterial pressure in the artificial kidney;

a third transducer for generating an electrical signal representative of venous pressure in the artificial kidney; and

first electrical circuit means for controlling the speed of the return pump in response to the electrical signals from the first, second and third transducers in a combination representative of transmembrane pressure such that the speed of the return pump maintains a predetermined transmembrane pressure in the artifical kidney.

4,153,555

CRYOGENIC BEACH CLEANER

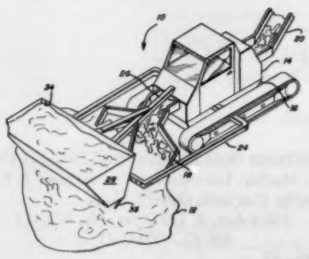
Jan R. Acker, 4402 Dwight Dr.; Norman R. Braton, 457 Agnes Dr.; James A. Koutsky, 3116 Gregory St., and Robert F. Wendt, 2649 Mason St., all of Madison, Wis. 53711

Filed Dec. 22, 1976, Ser. No. 753,553

The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.

Int. Cl.[2] B01D *17/00;* **F25C** *1/00*

U.S. Cl. 210—198 R **3 Claims**



1. An improved cryogenic beach-cleaning machine for cleaning a sandy beach which has been contaminated by oil from an oil spill mixing with the beach sand, said machine

including: means for moving said machine along said beach; means for contacting the contaminated area immediately forward of said machine with a liquid cryogen so as to cause solidification and permit subsequent separation and removal; and means for separating said solidified material from the beach, said separation apparatus being positioned in trailing relation to said contacting means; the improvement comprising in combination:

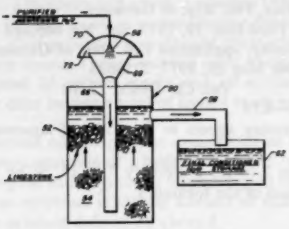
hopper means carried by said machine and positionable forwardly of and in leading relation to said liquid cryogen contacting means, said hopper means having storage means to receive particulate absorbent and means for controllably discharging said absorbent onto a contaminated area prior to the area being contacted by the liquid nitrogen.

4,153,556

METHOD AND APPARATUS FOR CONDITIONING DEMINERALIZED WATER

Alan B. Riedinger, La Jolla, Calif., assignor to UOP Inc., Des Paines, Ill.

Filed Dec. 28, 1977, Ser. No. 865,144
Int. Cl.[2] B01D *19/04*
U.S. Cl. 210—218 **1 Claim**



1. Apparatus for conditioning demineralized water by removing CO_2 and raising the pH comprising a vessel containing a bed of limestone chips, an open-ended water inlet tube extending downwardly from a point above the vessel into the bed of limestone chips and terminating in the lower portion of said bed and vessel for introducing the water to the bottom of the bed to pass upwardly through the bed, an outlet at the upper portion of the vessel for removing the water which has passed upwardly through said bed, an upwardly diverging entrance cone at the upper end of said inlet tube, and a wide-angle low pressure spray nozzle fluidly connected to an aggressive water supply through a conduit and positioned to discharge said aggressive water from said supply into the entrance cone, said entrance cone being open to the atmosphere and positioned relative to said spray nozzle so as to permit the water sprayed from the nozzle to film out relatively slowly on the surface of the entrance cone, thereby releasing the bulk of the free CO_2 contained therein, said bed of limestone chips being of a sufficient diameter and depth to insure a water residence time in contact with the chips of at least about two minutes.

4,153,557

BAR SCREEN

Mitsutaka Hori, 3128-5, Koizumi-cho, Yamatokoriyama-shi, Nara-ken, Japan

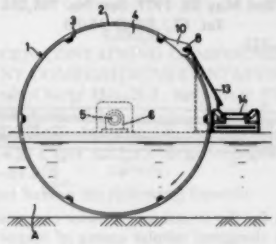
Filed Jan. 30, 1978, Ser. No. 873,534
Int. Cl.[2] B01D *33/06, 33/36*
U.S. Cl. 210—396 **2 Claims**

1. A bar screen for removing debris from liquid comprising:

a plurality of uniformly spaced rotatable ring bars, said ring bars having a common longitudinal axis;

a rotatable shaft adjacent the outer periphery of said ring bars, said shaft being parallel to the longitudinal axis of said ring bars; and

a plurality of scraper means having a first end fixedly mounted on said shaft and rotatable therewith and a second end opposite said first end extending into the spaces between said spaced ring bars for scraping debris from



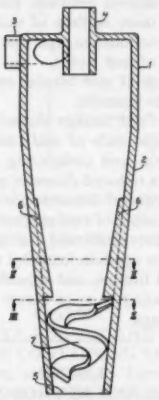
said spaces, said first end being continuously positioned between said ring bars, and said second end being movable away from between said ring bars when said rotatable shaft rotates.

4,153,558

HYDROCYCLONE SEPARATOR

Rune H. Frykhult, Huddinge, Sweden, assignor to AB Celleco, Stockholm, Sweden

Filed Mar. 8, 1978, Ser. No. 884,440
Int. Cl.[2] B01D *21/26, 33/02*
U.S. Cl. 210—512 R **4 Claims**

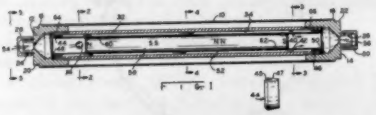


1. A hydrocyclone separator for separating a liquids/solids mixture into a light first fraction of relatively low density and a heavy second fraction of relatively high density, the separator comprising means forming a separation chamber having a circular cylindrical part provided with a tangential inlet for said mixture and with a central outlet for said light fraction, the separation chamber also having a conical part forming an outlet for said heavy fraction, a first guide bar located on the wall of said conical chamber part and positioned and dimensioned to give the heavy fraction, flowing helically along said wall, a component of movement directed radially inward, and guide means including a second guide bar extending along said wall between said first guide bar and said heavy fraction outlet and positioned and dimensioned to give the heavy fraction, flowing toward the heavy fraction outlet, a component of movement directed axially toward said light fraction outlet.

4,153,559
WATER TREATMENT DEVICE AND METHOD FOR MANUFACTURING SAME

Charles H. Sanderson, 3717 Fritcha Ave., Fort Wayne, Ind. 46806

Filed May 20, 1977, Ser. No. 798,854
Int. Cl.[2] B01D *35/06*
U.S. Cl. 210—222 **11 Claims**



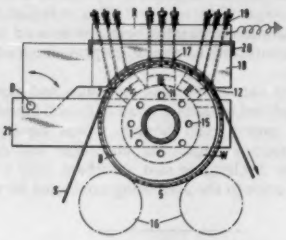
1. A device for the treatment of water comprising:
a one-piece elongated tubular casing of magnetic material, said casing having an inner surface,
an elongated magnet having at least two longitudinally spaced poles,
a one-piece fluid-tight jacket of non-magnetic material completely encasing said magnet, said jacket including an outer peripheral surface extending longitudinally with respect thereto,
said jacket including open tubular end portions extending beyond opposite ends of said magnet,
said jacket and magnet being positioned longitudinally within said casing,
means for supporting said jacket within said casing and spacing said jacket from said casing inner surface so as to form an annular chamber therebetween, said means for supporting comprising a pair of tapered elastic sleeves of non-magnetic material being positioned over opposite ends of said jacket between said jacket and said casing,
the ends of said jacket being flared outwardly so as to tightly compress said sleeves between the flared ends of said jacket and the inner surface of said casing, said sleeves being in tight frictional engagement with said casing and the flared ends of said jacket,
an aperture in each of said tubular end portions extending into said annular chamber,
first and second fluid fittings threadedly secured respectively to opposite ends of said casing, each said fitting being an integral unit comprising a hollow cylindrical portion having a reduced diameter portion and a shoulder adjacent said reduced diameter portion, and
an outer tubular casing of non-magnetic material positioned around said first mentioned casing and telescopically supported on its opposite ends by the reduced diameter portions of said fittings, said shoulders engaging the ends of said outer casing so as to center said outer casing between said fittings.

4,153,560
CORONA DEVICE AND METHOD FOR USING SAME

Peter Dinter, Hallgarten, and Andreas Kolbe, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,105
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643772
Int. Cl.[2] B01K *1/00*
U.S. Cl. 250—531 **25 Claims**

1. A corona discharge device for charging the surface of a material which comprises:
a. a rotatable roll comprising a cylindrical shell made of a dielectric material;
b. at least one first electrode located outside said roll;
c. at least one second electrode located within said roll, said first and second electrodes being arranged along the cylindrical contour of said shell with said second electrodes within said shell being in contact with said shell, and one of said first or second electrodes being adapted for carrying electrical current and the other being adapted to be grounded as a counter electrode; and



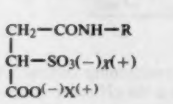
d. a spring means for pressing said second electrodes within said shell against the inside surface thereof.

4,153,561
CONDITIONING AGENT

Edwin Hümüller, Hofheim am Taunus; Karl-Heinz Keil, and Joachim Ribka, both of Offenbach am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

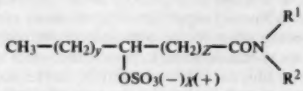
Filed Dec. 29, 1977, Ser. No. 865,612
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1976, 2659696; May 25, 1977, 2723525
Int. Cl.[2] D06M *13/40*
U.S. Cl. 252—8.75 **2 Claims**

1. Conditioning agents in the form of aqueous emulsions containing
(a) of from 5 to 20, preferably 5 to 15, % by weight of a compound of the formula I



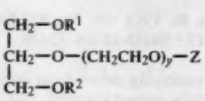
I,

wherein R is a branched or linear alkyl or alkylene group having of from 10 to 30, preferably of from 12 to 20, carbon atoms or a group of the formula R′—NH—$(CH_2)_n$—, n is an integer of from 2 to 4, X is a sodium, potassium or ammonium ion and R′ is defined as R;
(b) of from 2 to 20, preferably of from 3 to 15, % by weight, of a fatty acid amide sulfate of the formula II



II,

wherein R^1 and R^2 each is an alkyl group having of from 1 to 5 carbon atoms or R^1 is a hydrogen atom and R^2 is a C_{1-8}alkyl, phenyl or C_{1-4}alkylphenyl group, Y and Z each is an integer of from 6 to 8, preferably represent together 14, and X is defined as in formula I or, of from 2 to 20% by weight of a glycerine ether derivative of the formula III



III

wherein R^1 and R^2 represent identical or different, branched or linear C_{4-8}alkyl groups, preferably branched C_8alkyl groups, Y is zero or an integer of from 1 to 4 and Z is a group of the formulae —$(CH_2)_n$—COOMe, —SO_3.

Me_2 or $—PO_3Me_3$, n is 1, 2 or 3 and Me is an alkali metal, ammonium or trialkylammonium ion;

(c) of from 1 to 15, preferably of from 1 to 3, % by weight, of a polyethylene glycol of the formula IV

$$HO(CH_2CH_2O)_mH \qquad IV$$

wherein m is an integer of from 100 to 400, preferably of from 100 to 250 and

(d) of from 1 to 5, preferably of from 1 to 3, % by weight of a non ionic ethylene oxide addition product, as emulsifier.

4,153,562

ANTIOXIDANTS FOR LOW ASH AND MEDIUM ASH LUBRICATING OILS

John J. Jaruzelski, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 23, 1977, Ser. No. 863,793
Int. Cl.[2] C10M *1/48*
U.S. Cl. 252—46.6 **16 Claims**

1. An oil-soluble condensation reaction product, useful as an antioxidant in lubricating oil compositions, of a dithiophosphoric acid ester of an alkyl phenol sulfide defining a SH group, with an unsaturated material which reacts with said SH group to form a thioester and which is selected from the group consisting of styrene, an alkyl styrene having from 1 to 6 carbon atoms in alkyl groups, a non-straight chain olefin of from 7 to 12 carbon atoms, a vinyl alcohol ester having a total of from 4 to about 20 carbon atoms, and an acrylate ester or methacrylate ester having a total of from 4 to about 20 carbon atoms.

8. An improved oil composition comprising an oil selected from the group consisting of a hydrocarbon fuel, a hydrocarbon lubricating oil and a synthetic lubricating oil to which has been added an oxidation inhibiting amount of said oil-soluble condensation product defined by claim **1**.

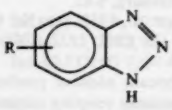
4,153,563

LUBRICANT COMPOSITIONS CONTAINING BENZOTRIAZOLE-ALLYL SULFIDE REACTION PRODUCTS

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

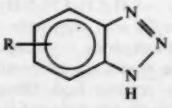
Filed May 24, 1978, Ser. No. 909,222
Int. Cl.[2] C10M *1/38;* C07D *249/18*
U.S. Cl. 252—47 **24 Claims**

1. A lubricant composition which comprises an oleaginous material and, in an amount effective to impart corrosion prevention and antioxidation properties thereto, the reaction product of (1) a benzotriazole compound having the formula:



where R is hydrogen or a hydrocarbyl group containing 1 to about 12 carbon atoms and (2) an organic sulfur containing compound selected from the group consisting of α and β substituted allyl sulfides, α and β substituted allyl disulfides, and sulfurized olefins having reactive unsaturated bonds.

18. A reaction product of (1) of benzotriazole compound having the formula:



where R is hydrogen or a hydrocarbyl group containing from 1 to about 12 carbon atoms and (2) an organic sulfur containing compound selected from the group consisting of α and β substituted allyl sulfides, α and β substituted allyl disulfides, and sulfurized olefins having reactive unsaturated bonds.

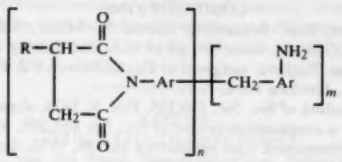
4,153,564

NITROGEN-CONTAINING COMPOUNDS AND LUBRICANT COMPOSITIONS CONTAINING SAME

Sheldon Chibnik, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

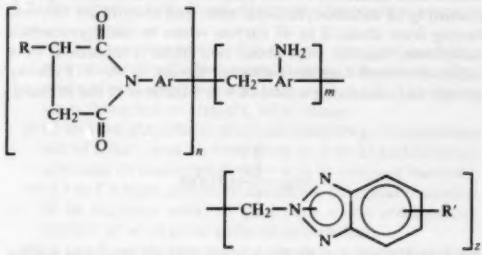
Filed Apr. 24, 1978, Ser. No. 899,678
Int. Cl.[2] C10H *1/22;* C07D *207/12, 249/18*
U.S. Cl. 252—51.5 A **18 Claims**

1. A product having the following formula



wherein R is an alkenyl group containing from 40 to 1000 carbon atoms, Ar is an aromatic hydrocarbyl containing 6 to 18 carbon atoms, n is from 1 to 3 and m is from 1 to 3.

7. A product having the following formula



wherein R is an alkenyl group containing 40 to 1000 carbon atoms, R′ is hydrogen or a lower alkyl, Ar is an aromatic hydrocarbyl containing 6 to 18 carbon atoms, n is from 1 to 3, m is from 1 to 3 and z is from 1 to 2.

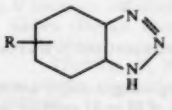
4,153,565

BENZOTRIAZOLE ADDUCT AND LUBRICANT COMPOSITIONS CONTAINING SAID ADDUCT

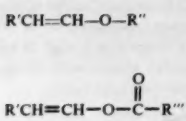
Milton Braid, Westmont, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,856
Int. Cl.[2] C10M *1/20, 1/32;* C07D *249/00*
U.S. Cl. 252—51.5 A **18 Claims**

1. A lubricant composition which comprises a lubricating medium, and in an amount effective to impart antioxidation and metal corrosion prevention properties thereto, the adduct of (1) a benzotriazole compound having the formula:



wherein R is hydrogen or a hydrocarbyl group containing from 1 to about 12 carbon atoms; and (2) an alkyl vinyl ether or a vinyl ester of a hydrocarbylcarboxylic acid, having the formula:



where R′ is hydrogen or an alkyl group containing from 1 to about 8 carbon atoms, R″ is an alkyl group containing from 1 to about 18 carbon atoms, and R‴ is an alkyl group, an aryl group, an alkaryl group or an aralkyl group containing from 1 to about 18 carbon atoms.

4,153,566

OXAZOLINE ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

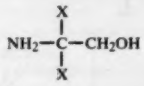
Jack Ryer, East Brunswick; Harold N. Miller, Millington; James Zielinski, Somerset, all of N.J., and Stanley J. Brois, Wantage, England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 530,235, Dec. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 455,250, Mar. 27, 1974, abandoned. This application Jul. 30, 1976, Ser. No. 710,279

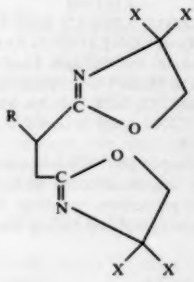
Int. Cl.[2] C10M *1/32*

U.S. Cl. 252—51.5 A **10 Claims**

1. A lubricating oil composition comprising: a major amount of lubricating oil and 0.1 to 10 wt. % of bis-oxazoline of a molar proportion of a hydrocarbon-substituted C_4–C_{10} mono unsaturated dicarboxylic acid material selected from the group consisting of dicarboxylic acid, ester and anhydrides thereof, having from about 8 to 49 carbon atoms in said hyrocarbon substituent; reacted with about two molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons of the formula:

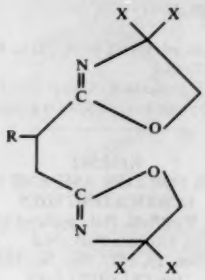


wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $-(CH_2)_nOH$ where n is 1 to 3; at a temperature in the range of about 140 to 240° C. for about ½ to 24 hours with the removal of about three molar proportions of water to thereby produce said bis-oxazoline having the structure

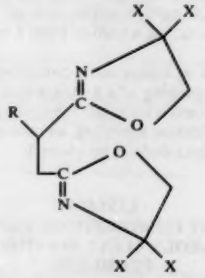


wherein R is said hydrocarbon substituent and X is as defined above.

6. An additive concentrate comprising: a major amount of mineral lubricating oil in the range of 98 to 45 parts by weight, 2 to 45 parts by weight of bisoxazoline of a molar proportion of a hydrocarbon-substituted C_4–C_{10} mono unsaturated dicarboxylic acid material selected from the group consisting of dicarboxylic acid, ester and anhyrides thereof; having from about 8 to 49 carbon atoms in said hydrocarbon substituent; reacted with about two molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons of the formula:



wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $-(CH_2)_nOH$ where n is 1 to 3; at a temperature in the range of about 140° to 240° C. for about ½ to 24 hours with the removal of about three molar proportions of water to thereby produce said bis-oxazoline having the structure



wherein R is said hydrocarbon substituent and X is as defined above.

4,153,567

ADDITIVES FOR LUBRICANTS AND FUELS

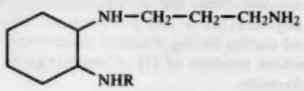
Edward W. Kluger, Pauline; John W. Miley, Inman, and Tien K. Su, Spartanburg, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 10, 1977, Ser. No. 850,457

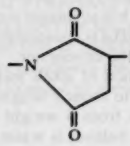
Int. Cl.[2] C10M *1/32*; C10L *1/22*; C07D *207/24, 209/32*

U.S. Cl. 252—51.5 A **11 Claims**

1. A fuel and lubricant additive produced by the process comprising simultaneously reacting substantially equal molar amounts of a polyamine substituted cycloaliphatic compound having the general structure

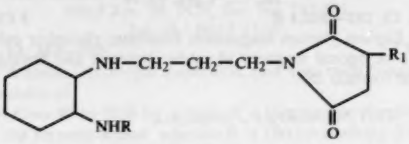


wherein R is H or $-CH_2CH_2CH_2NH_2$ with a substituted aliphatic polycarboxylic acid anhydride acylating agent said polycarboxylic acid anhydride acylating agent containing at least about 12 carbon atoms, at a temperature and for a period of time effective to remove from the reaction mixture an amount of water equivalent to the number of moles of an imide derivative moiety having the general structure

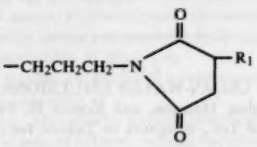


present in said addtive, R_1 of said imide derivative moiety being an alkyl moiety containing at least about 8 carbon atoms or a substantially saturated olefin polymer having an average molecular weight of from 200 to about 5000.

9. A composition comprising a major portion of a lubricant or fuel and a minor effective amount of a dispersant having the general structure



wherein R is H, $-CH_2CH_2CH_2NH_2$ or



and R_1 is an alkyl moiety containing at least about 8 carbon atoms or a substantially saturated olefin polymer having an average molecular weight of from about 200 to about 5000.

4,153,568

PROCESS OF ENHANCING THE AROMA OF A SOAP WITH NORBORNANE DERIVATIVES

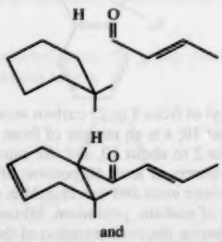
Kenneth K. Light, Long Branch; James M. Sanders, Eatontown; Manfred H. Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853. This application Dec. 13, 1977, Ser. No. 860,144

Int. Cl.[2] C11D *9/04*

U.S. Cl. 252—108 **6 Claims**

1. A process for augmenting or enhancing the aroma of a soap comprising the step of intimately admixing with soap chips either (i) a norbornane derivative having a structure selected from the group consisting of:



and

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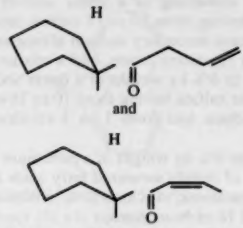


and

and mixtures of some or (ii) a mixture of 2-(2-butenoyl)-3,3-dimethylnorbornane; 2-(2-butenoyl)-3,3-dimethylnorbornane; 2-(2-butenoyl)-3,3-dimethylnorbornane and α-allyl-3,3-dimethyl-2-norbornanemethanol until a substantially homogenous composition is obtained, said norbornane derivative or said mixture being present in said composition in an amount of from 1% up to 3% by weight.

4,153,569

BUILT LIQUID DETERGENT

Guido C. van den Brom, Nieuw-Beijerland, Netherlands, assignor to Lever Brothers Company, New York

Filed Oct. 5, 1977, Ser. No. 839,535

Claims priority, application United Kingdom, Oct. 11, 1976, 42175/76

Int. Cl.[2] C11D *9/14*

U.S. Cl. 252—109 **5 Claims**

1. An aqueous built liquid detergent composition comprising:

(a) 3 to 12 weight percent of an anionic detergent consisting of a potassium alkylbenzenesulphonate, wherein the alkyl chain of said alkylbenzenesulphonate is a 10 to 18 carbon atom, branched or straight, alkyl chain;

(b) 2 to 8 weight percent of a soap consisting of a potassium salt of a fatty acid, derived from an 8 to 22 carbon atom, saturated or unsaturated, fatty acid or polymer thereof;

(c) 0.5 to 5 weight percent of a nonionic detergent consisting of an ethylene oxide or propylene oxide condensation product of an organic hydrophobic radical;

(d) 0.1 to 2 weight percent of a copolymer consisting of the copolymer of maleic anhydride with a compound selected from the group consisting of vinyl methyl ether, ethylene, and styrene, said copolymer having a specific viscosity of 0.1 to 4.5 measured as a one percent weight/volume solution of said copolymer in methylethylketone at 25° C.; and

(e) 1 to 25 percent of a mixture of sodium tripolyphosphate and tetrapotassium pyrophosphate, said mixture comprising 20 to 65 percent by weight, calculated on said mixture, of tetrapotassium pyrophosphate; and

wherein said copolymer has been partially esterified with said nonionic and subsequently neutralized, the ratio of the copolymer to nonionic to obtain the partially esterified copolymer ranging from 50:1 to 1:2.5.

4,153,570

LOW-FOAMING LIQUID WASHING AGENT CONCENTRATES

Manfred Hennemann, Düsseldorf-Benrath; Albrecht Löhr, Ratingen-Eggerscheid, and Peter Krings, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,510

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1977, 2703998

Int. Cl.[2] C11D *9/32*

U.S. Cl. 252—121 **21 Claims**

1. A low-foaming, liquid, aqueous washing agent concentrate consisting essentially of:

(a) from 5% to 12% by weight of a member selected from the group consisting of a linear sodium alkyl benzene sulfonate having from 10 to 13 carbon atoms in the alkyl chain, a linear secondary sodium alkane sulfonate having from 14 to 18 carbon atoms, and a mixture thereof;

(b) from 2% to 6% by weight of a linear sodium alkylpolyglycol ether sulfate having from 10 to 16 carbon atoms in the alkyl chain and from 1 to 3 ethylene glycol ether groups;

(c) from 2% to 6% by weight of a potassium or sodium soap composed of mainly saturated fatty acids having from 12 to 18 carbon atoms, of which 50% to 90% by weight have from 16 to 18 carbon atoms;

(d) from 15% to 28% by weight of a mixture of ethoxylated alcohols, composed of (i) from 30% to 50% by weight of linear primary ethoxylated alcohols having from 16 to 18 carbon atoms and 8 to 12 glycol ether groups and (ii) from 30% to 50% by weight of linear primary ethoxylated alcohols having from 16 to 18 carbon atoms and 3 to 7 glycol ether groups, both types of said ethoxylated alcohols having a ratio of saturated to mono-unsaturated hydrocarbon radicals of from 1:4 to 4:1, and (iii) from 10% to 30% by weight of a member selected from the group consisting of linear, primary, saturated ethoxylated alcohols, primary saturated ethoxylated alcohols having a methyl group in the 2-position, and mixtures thereof, said primary saturated ethoxylated alcohols having from 10 to 15 carbon atoms and from 4 to 9 glycol ether groups;

(e) from 2% to 7% by weight of a diethanolamide of fatty acids having from 10 to 16 carbon atoms in the fatty acid radial;

(f) from 4% to 10% by weight of a member selected from the group consisting of toluene sulfonate, xylene sulfonate and isopropylbenzene sulfonate in the form of the sodium, potassium or triethanolamine salt; and

(g) from 2% to 7% by weight of an alkanol having from 1 to 3 carbon atoms;

and the remainder of said concentrate being water and optionally other conventional ingredients; with the proviso that (1) the total of all anhydrous components of said concentrate is from 40% to 65% by weight of said concentrate, (2) phosphates and salts of polymer carboxylic acids are absent, and (3) the content of alkanolamines is kept below 3% by weight.

4,153,571

HEAT DEPENDENT ALKALI GEL CLEANING COMPOSITIONS AND PROCESS FOR CLEANING GREASY SURFACES

Donald F. Garvin, Wyandotte, and Otto T. Aepli, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 2, 1974, Ser. No. 429,979
Int. Cl.[2] C11D *7/26*
U.S. Cl. 252—156 **4 Claims**

1. An aqueous composition, which gels at temperatures greater than 100° F., suitable for the removal of greasy soil from surfaces consisting essentially of water, an alkali metal hydroxide and a surfactant selected from the group consisting of

(a) an ethoxylated alcohol of the formula:

$$Y—O(C_2H_4O)_nH$$

wherein Y is a straight chain alkyl group having an average of 19 carbon atoms, n is an integer such that the hydrophile represented by (C_2H_4O) constitutes from about 75 to 95 weight percent of the total weight of the surfactant and the molecular weight is about 1500 and

(b) a polyoxyethylene-polyoxypropylene copolymer of the formula:

$$HO(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_aH$$

wherein a is an integer such that the hydrophobe base represented by (C_3H_6O) has an average molecular weight of at least 3200 and b is an integer such that the hydrophile represented by (C_2H_4O) constitutes from about 70 to 95 weight percent of the copolymer,

wherein the concentration of alkali metal hydroxide is from about 1 weight percent to about 7 weight percent, the concentration of surfactant is from 4 weight percent to about 30 weight percent and the balance is water.

4,153,572

ULTRAVIOLET EMITTING CEYMG ALUMINATE FLUORESCENT LAMP PHOSPHOR FOR PSORIASIS TREATMENT

Robert W. Wolfe, Wysox, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 14, 1978, Ser. No. 915,495
Int. Cl.[2] C09K *11/46*
U.S. Cl. 252—301.4 R **3 Claims**

1. Cerium yttrium magnesium aluminate phosphor exhibiting a hexagonal magneto plumbite structure and having the molar formula of

$$Ce_xY_yMg_zAl_{11}O_{16.5\ +\ 3/2\ (x+y)+z}$$

where x is within the range 0.375 and 0.750, y is within the range of 0.050 and 0.350 and z is within the range 0.500 and 2.000, and where the sum of x and y are equal to or less than 1.0.

4,153,573

OIL-IN-WATER EMULSIONS

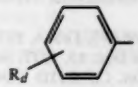
George Kalfoglou, Houston, and Kenoth H. Flournoy, Levelland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 664,711, Mar. 8, 1976, Pat. No. 4,099,337.
This application Jan. 11, 1978, Ser. No. 868,588
Int. Cl.[2] F17D *1/17;* **B01F** *17/00*
U.S. Cl. 252—312 **2 Claims**

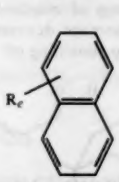
1. An oil-in-water emulsion comprising a viscous hydrocarbon and as the aqueous phase an aqueous solution of an alkalinity agent selected from the group consisting of sodium hydroxide, potassium hydroxide and lithium hydroxide and an oxyalkylated anionic surfactant of the formula:

$$R_cO(C_2H_4O)_r—(C_3H_6O)_s—(C_2H_4O)_tCH_2CH-{}_2SO_3M,$$

wherein R_c is selected from the group consisting of alkyl of from 10 to 25 carbon atoms;



wherein R_d is alkyl of from 8 to 25 carbon atoms, and



wherein R_e is alkyl of from 8 to 25 carbon atoms; r is an integer of from 2 to about 10; s is an integer of from 1 to about 8; t is an integer of from 2 to about 10, and the sum of r+s+t is not more than 20, wherein at least 60 percent of the oxyalkylene units are oxyethylene units and wherein M is selected from the group consisting of sodium, potassium, lithium and the ammonium ion, and wherein the concentration of the alkalinity agent

in the aqueous solution is from about 0.01 to about 1.0 percent, wherein the concentration of the said surfactant in the aqueous solution is from about 0.01 to about 2.5 weight percent and wherein the volume of solution in the said emulsion will range from about 8 percent to about 60 percent based on the volume of the hydrocarbon.

4,153,574

STABLE DISPERSIONS CONTAINING TRIORGANOTIN FLUORIDES

Charles B. Beiter, Carteret, and Leroy A. Hafner, Edison, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Jan. 28, 1977, Ser. No. 763,406
Int. Cl.[2] B01J *13/00*
U.S. Cl. 252—316 **7 Claims**

1. A stable thixotropic dispersion, said dispersion consisting essentially of:

(a) from 40 to 70% by weight of a triorganotin fluoride of the formula R_3SnF wherein R is alkyl containing from 2 to 12 carbon atoms or phenyl;

(b) from 20 to 60% by weight of an organic liquid selected from the group consisting of alcohols containing from 4 to 12 carbon atoms, aliphatic hydrocarbons containing from 5 to 12 carbon atoms and aromatic hydrocarbons having a kauri butanol value of 96 or less;

(c) from 0.5 to 10% by weight of a compound selected from the group consisting of:

(1) carbonic, phosphoric, hypophophorous and phosphorous acid salts of lithium, sodium, beryllium, magnesium and calcium,

(2) carboxylic acid salts of lithium, sodium, beryllium, magnesium and calcium, wherein said carboxylic acid contains from 2 to 12 carbon atoms, and

(3) hydroxides of lithium, sodium, potassium, beryllium, magnesium and calcium.

4,153,575

METHOD FOR TRANSPORTATION OF VISCOUS HYDROCARBONS BY PIPELINE

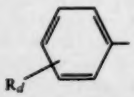
George Kalfoglou, Houston, and Kenoth H. Flournoy, Levelland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 664,711, Mar. 8, 1976, Pat. No. 4,099,537.
This application Jan. 11, 1978, Ser. No. 868,589
Int. Cl.[2] F17D *1/17;* **B01F** *17/42*
U.S. Cl. 252—352 **1 Claim**

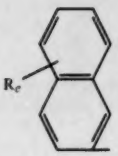
1. An aqueous solution for use in forming oil-in-water emulsions comprising 0.01 to about 2.5 weight percent of a surfactant of the formula:

$$R_cO(C_2H_4O)_r—(C_3H_6O)_s—(C_2H_4O)_tCH_2CH\text{-}{}_2SO_3M,$$

wherein R_c is selected from the group consisting of alkyl of from 10 to 25 carbon atoms;



wherein R_d is alkyl of from 8 to 25 carbon atoms, and



wherein R_e is alkyl of from 8 to 25 carbon atoms, r is an integer of from 2 to about 10; s is an integer of from 1 to about 8; t is an integer of from 2 to about 10, and the sum of r+s+t is not more than 20, wherein at least 60 percent of the oxyalkylene units are oxyethylene units and wherein M is selected from the group consisting of sodium, potassium, lithium and the ammonium ion and wherein the said aqueous solution contains from about 0.01 to about 1.0 weight percent of an alkalinity agent selected from the group consisting of sodium hydroxide, potassium hydroxide and lithium hydroxide.

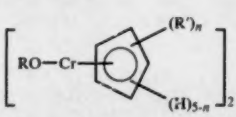
4,153,576

CYCLOPENTADIENYL CHROMIUM OXIDES

Frederick J. Karol, Belle Mead, N.J.; Chisung Wu, Beaconsfield, Canada; Walter T. Reichle, Warren, and Norma J. Maraschin, Somerset, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 779,690, Mar. 21, 1977, Pat. No. 4,115,425.
This application May 2, 1978, Ser. No. 902,222
Int. Cl.[2] C08F *4/78;* **B01D** *47/02*
U.S. Cl. 252—428 **4 Claims**

1. An ethylene polymerization catalyst composition comprising a dried silica support and deposited thereon an effective amount of a cyclopentadienyl chromium alkyl/aryl oxide or siloxide having the formula:



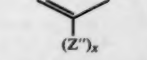
wherein n is an integer having values of 0 to 5, R′ is alkyl having 1 to 10 carbons and R is a monovalent sterically hindered radical selected from the group consisting of:

(1)

wherein each of Y, Y′ and Y″ is alkyl having 1 to 18 carbons or aryl having 6 to 12 carbons,

(2)

wherein Y, Y′ and Y″ are as defined above and



(3)

wherein Z and Z′ are secondary or tertiary alkyls containing 3 to 5 carbon atoms, Z″ is an alkyl group containing 1 to 6

carbon atoms and x is an integer having values of 0 to 1, together with at least one silane compound having the structure:

$$H_3Si-(SiH_2)_mH \text{ or } R'_{4-p}Si-H_p$$

wherein m is an integer having values of 0 to 3, R' is a saturated or unsaturated hydrocarbon group having 1 to 10 carbons and p is an integer having values of 1 to 4.

4,153,577

OXIDATION CATALYSTS AND PROCESS FOR PREPARING ANHYDRIDE FROM ALKANES

Bruno J. Barone, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Filed May 4, 1977, Ser. No. 793,752
Int. Cl.[2] B01J *27/14;* **C07D** *307/89*
U.S. Cl. 252—435 **2 Claims**

1. A catalyst composition for use in the partial oxidation of C_4 to C_{10} alkane hydrocarbons to anhydride consisting of vanadium, phosphorus, oxygen and a modifying component consisting of

I (a) the elements Cu, Mo, Ni, Co, Cr, Nd, Ce, Ba, Y and Sm, wherein the atomic ratio of vanadium:phosphorus:modifying component is 1:0.90 to 1.3:0.0411 to 0.4, respectively.

4,153,578

CATALYST COMPRISING RANEY NICKEL WITH ADSORBED MOLYBDENUM COMPOUND

Waldo R. De Thomas, Parsippany, and Eugene V. Hort, Wayne, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,253
Int. Cl.[2] B01J *23/64, 23/88, 25/02, 27/24*
U.S. Cl. 252—438 **9 Claims**

1. An improved Raney nickel catalyst comprising Raney nickel solids having adsorbed therein a molybdenum compound in an amount of about 0.5–15 parts by weight molybdenum per 100 parts of the Raney nickel solids.

4,153,579

PLATINUM, RHODIUM, AND PALLADIUM CATALYST FOR AUTOMOTIVE EMISSION CONTROL

Jack C. Summers, Rochester, and Louis Hegedus, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 871,706, Jan. 23, 1978, Pat. No. 4,128,506. This application Feb. 6, 1978, Ser. No. 875,616
Int. Cl.[2] B01J *21/04, 23/10, 23/42, 23/44*
U.S. Cl. 252—462 **6 Claims**

1. A three-way catalyst adapted for use in a system operating at about the stoichiometric air/fuel ratio of an automotive engine and having desirable conversion and poison resistance characteristics, consisting essentially of an alumina support having platinum, palladium and rhodium deposited thereon and having a first layer of the catalyst material platinum which is resistant to poisoning by lead and phosphorous, the concentration of platinum being maximum at the surface of said support and decreasing with progressive penetration into said support, a second layer of catalyst material selected from the group consisting of rhodium and a mixture of palladium and rhodium adjacent to and inward of said first layer and penetrating the body of the support, the concentration of the catalyst material of the second layer present in the first layer being at a minimum at or close to the surface and increasing to a maximum with increasing depth of penetration, the greater portion of the catalyst materials other than platinum being below said first layer, and palladium being inward of and adjacent to said second layer where the catalyst material of said second layer is rhodium, said first layer of platinum serving to protect the rhodium and palladium therebelow from poisoning, the total amount of rhodium on said catalyst being as low as about 0.002% or more by weight.

4,153,580

CO CONVERSION CATALYST

Arthur L. Hausberger, Jeffersontown, and Edward K. Dienes, Louisville, both of Ky., assignors to United Catalysts Inc., Louisville, Ky.

Filed Dec. 9, 1977, Ser. No. 859,271
Int. Cl.[2] B01J *23/10, 23/28, 23/88*
U.S. Cl. 252—462 **3 Claims**

1. A stabilized, sulfactive CO conversion catalyst comprising catalytically active amounts of the oxide of molybdenum supported on an alumina carrier, the improvement wherein said catalyst has been formed by the steps of:

A. mechanically blending together a hydrated aluminum oxide and a solution of a compound of a rare earth metal to form a homogenous mass,
B. drying said homogenous mass,
C. forming the dried mass into particles,
D. calcining said formed particles, and thereafter
E. dipping said formed and calcined particles into a solution of a heat-decomposable compound of molybdenum, and
F. thereafter drying and calcining said particles to convert said heat-decomposable compound of molybdenum to the oxide.

4,153,581

METHOD OF PRODUCING AMINES FROM ALCOHOLS, ALDEHYDES, KETONES AND MIXTURES THEREOF

Clarence E. Habermann, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 1, 1977, Ser. No. 829,758
Int. Cl.[2] B01J *23/40, 23/74*
U.S. Cl. 252—472 **23 Claims**

19. A catalyst for preparing amines from at least one alcohol, aldehyde or ketone, or a mixture thereof, the catalyst comprising, calculated in mole percent and on an oxide-free basis, about:

(1) 20 to about 90 percent cobalt;
(2) 8 to about 72 percent copper; and
(3) 1 to about 16 percent of a third component selected from the group consisting of iron, zinc, zirconium and mixtures thereof.

4,153,582

METHOD FOR THE PREPARATION OF POLYMERS OF LACTAMS HAVING AN ENHANCED ELECTRIC CONDUCTIVITY

Rudolf Puffr, and Jan Sebenda, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Apr. 19, 1977, Ser. No. 788,977
Claims priority, application Czechoslovakia, Apr. 30, 1976, 2864/76
Int. Cl.[2] H01B *1/06;* **C08L** *77/02*
U.S. Cl. 252—511 **3 Claims**

1. Method for the preparation of semiconductive polyamides, having a specific electric resistance, measured at relative humidity of 50% and 25° C., of below 10^9 Ω.cm, by anionic polymerization comprising first forming a dispersed admixture of 100 weight parts of at least one anhydrous molten lactam containing 7–13 atoms in the ring, a basic polymerization initiator, an accelerating activator, 2–20 weight parts of at least one anhydrous hydrophilic plasticizer selected from the group consisting of N,N-dialkoxyacrylamide, N,N-dialkylmethacrylamide, N,N-dialkylacrylamide, N,N-dialkoxymethacrylamide and polyethylene glycol, and 1 to 50 weight parts of a material selected from the group consisting of finely ground graphite and conductive black, and subsequently polymerizing said admixture.

4,153,583

STABILIZED ANIONIC SURFACTANTS

Roger I. Hancock, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 31, 1978, Ser. No. 873,954

Claims priority, application United Kingdom, Jul. 11, 1977, 28987/77

Int. Cl.[2] C11D *1/12*

U.S. Cl. 252—550 9 Claims

1. A composition comprising: an anionic surfactant selected from the group consisting of sodium and potassium salts of C_{12} to C_{18} alkanoic acids, sodium, potassium, ammonium, and triethanol amine salts of alkane and alkene sulphonic acids in which the alkane or alkene group contains 10 to 20 carbon atoms, sodium and potassium alkylbenzene sulphonates in which the alkyl group contains 6 to 16 carbon atoms, sodium, potassium, ammonium and triethanolamine salts of C_{10} to C_{18} alcohol sulphates and sodium, potassium, ammonium and triethanolamine salts of ethoxylated alcohol sulphates and ethoxylated alkylphenol sulphates; and

a stabilizing amount, in the range 0.0005 to 5% by weight based on the anionic surfactant of an alkane which is substituted by at least 3 hydroxyphenyl groups having the formula:

$$ZCHX^1CHR^1R^2$$

in which R^1 and R^2 are hydroxyphenyl groups and in which Z is hydrogen, a phenyl or hydroxyphenyl group, an alkyl group or a group of formula $YCHX^2$ in which Y is hydrogen, a phenyl or hydroxyphenyl or alkyl group or a gorup of formula $X^3X^4HC(CH_2)_m$ in which m is 0 or an integer having a value of 1 to 4, in which at least one of X^1, X^2, X^3, and X^4 represents a hydroxyphenyl group the remainder beng hydrogen.

4,153,584

HIGH MOLECULAR WEIGHT HIGH UNSATURATION C_4-C_{10} ISOOLEFIN CONJUGATED DIOLEFIN COPOLYMERS AND MULTIPOLYMERS CONTAINING METHYLCYCLOPENTADIENE

Warren A. Thaler, Matawan; Donald J. Buckley, Plainfield, both of N.J., and Joseph P. Kennedy, Akron, Ohio, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 787,366, Apr. 14, 1977, which is a continuation-in-part of Ser. No. 631,444, Nov. 13, 1975, Pat. No. 4,031,300, which is a continuation-in-part of Ser. No. 457,109, Apr. 1, 1974, Pat. No. 3,928,297, which is a continuation-in-part of Ser. No. 151,038, Jun. 8, 1971, Pat. No. 3,808,177. This application Apr. 20, 1978, Ser. No. 898,473

Int. Cl.[2] C08C *19/30;* C08J *3/24;* C08K *5/36*

U.S. Cl. 260—5 31 Claims

1. The vulcanizable composition which comprises:

(a) a major portion of a substantially gel-free polymer consisting essentially of an isoolefin having about 5 to about 10 carbon atoms and about 5 to about 45 mole % of a conjugated diolefin being methylcyclopentadiene, said polymer having a number average molecular weight of at least 120,000;

(b) a vulcanizing amount of a sulfur donor; and

(c) a delayed action accelerator.

28. The composition of claim 1, further including a rubber at a concentration level of about 5 to about 95 parts by weight per one hundred parts of the total of said polymer and said rubber, said rubber being selected from the group consisting of nonpolar crystallizable rubbers, polar crystallizable rubbers, nonpolar non-crystallizable rubbers, and polar non-crystallizable rubbers.

4,153,585

STARCH ETHER DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 8, 1978, Ser. No. 903,712

Int. Cl.[2] C08L *3/02, 3/08*

U.S. Cl. 260—17.4 GC 10 Claims

1. As a new composition of matter, a crosslinkable starch ether derivative prepared by reacting a starch base in water at pH 11–13 for 1–40 hours with about 1–100% by weight, based on dry starch, of an N-(alkoxymethyl)acrylamide wherein the alkoxy group has 1 to 4 carbon atoms, said reaction being carried out at a temperature of 20°–95° C. when said starch base is non-granular, and at a temperature of 20°–60° C. when said starch base is granular.

4,153,586

PROCESS OF MAKING EPOXY RESINS MODIFIED WITH MERCAPTOCARBOXYLATES

Thomas R. Hockswender, Gibsonia, and Marvis E. Hartman, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 13, 1978, Ser. No. 885,935

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—18 EP 17 Claims

1. A process of making modified epoxy resins comprising reacting a polyepoxide having a 1,2-epoxy equivalency of greater than 1.0 with a mercaptan compound having the structure $HS—R—(COOX)_m$, wherein R is an organic radical having from 1 to 10 carbon atoms, X is hydrogen or a moiety formed by reacting the carboxylic acid with a basic compound to form its salt and m is an integer of from 1 to 5 wherein the equivalent ratio of epoxy groups in the polyepoxide to mercaptan groups is from about 1.0:0.25 to about 1.0:1.25, said process occurring in the presence of a tin catalyst so as to produce the modified epoxy resins resulting from the ring opening reaction of an epoxide group on the polyepoxide molecule and the sulfhydryl hydrogen.

2. The process of claim 1 wherein a level of tin catalyst of from about 0.1 percent to about 5 percent based on the polyepoxide solids is present.

3. The process of claim 2 wherein the tin catalyst is selected from the group consisting of stannous chloride, stannous fluoride, stannous sulfate, tin naphthanate, tin benzoate, stannous octoate, tin butyrate, tin-2-ethylhexanoate, dibutyl tin dioctoate, dibutyl tin dilaurate, dibutyl tin diacetate, stannous acetate and mixtures thereof.

4,153,587

HIGH INORGANIC FILLER CONTENT COMPOSITION

Hiroshi Yui, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 514,131, Oct. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 430,413, Jan. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 260,529, Jun. 7, 1972, abandoned. This application May 6, 1977, Ser. No. 794,612

Int. Cl.[2] C08K *3/00, 9/04*

U.S. Cl. 260—23 H 8 Claims

1. In a modified propylene polymer containing a mixed polymer composition characterized by high tensile strength, high elongation and good bending stiffness, which consists essentially of:

a. 95–60 wt. % of a crystalline propylene homopolymer,

b. 1–20 wt. % of a crystalline block copolymer having the structure polypropylene-(ethylene-propylene) random copolymer, and

c. 3–35 wt. % of a crystalline random ethylene-propylene copolymer, wherein the ethylene content of said modified propylene polymer is 12 wt. % to 15 wt. %, the improvement which comprises: admixing with said modified prop-

ylene polymer at least 30 wt. % of an inorganic filler having an average particle size of less than 20 microns in diameter.

4,153,588

METAL NEUTRALIZED SULFONATED EPDM TERPOLYMERS AND COMPOSITIONS THEREOF

Henry S. Makowski, Scotch Plains; Robert R. Klein, Berkeley Heights, and Robert D. Lundberg, Bridgewater, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,724
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23.5 A **16 Claims**

1. An elastomeric composition which consists essentially of:

(a) a metal neutralized sulfonated EPDM terpolymer having at least about 65 wt. % ethylene in the backbone of said metal neutralized sulfonated EPDM terpolymer, about 10 to about 60 meq. of metal sulfonate groups per 100 grams of said metal neutralized sulfonated EPDM terpolymer, a metal of said metal sulfonate groups being selected from the group consisting of aluminum, iron, antimony, mercury and Groups IA, IIA and IB of the Periodic Table of Elements and mixtures thereof; and

(b) at least 8 parts by weight of a preferential plasticizer per 100 parts of said metal neutralized sulfonated EPDM terpolymer, said preferential plasticizer being selected from the group consisting of stearamides and zinc salts of carboxylic acids having about 12 to about 30 carbon atoms.

4,153,589

THERMOPLASTIC ELASTOMERIC MOLDING COMPOSITION AND ARTICLES MOLDED THEREFROM

Louis J. Triolo, Hasbrouck Heights, N.J., assignor to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 635,698, Nov. 26, 1975, abandoned. This application May 23, 1977, Ser. No. 799,842
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 B **29 Claims**

1. A thermoplastic molding composition processable into a useful elastomeric article, said composition consisting essentially of:

(a) a vulcanizable EPDM elastomeric terpolymer in an amount within the range from about 26% to about 49% by weight of the total composition, wherein said EPDM terpolymer has an ethylene content within the range of from about 65% to about 85% by weight of the total terpolymer, and a diene content within the range of up to about 4% by weight of said total terpolymer;

(b) an inert filler free from polyolefins in an amount within the range of from about 25% to about 55% by weight of said total composition, said filler consisting of a blend of at least two different filler materials, said blend of at least two different filler materials being selected from the group consisting of carbon black, coal dust, clay, calcium carbonate, silica, thermoplastic phenolic resin and non-conductive fillers; and

(c) the remainder of the composition being made up of suitable quantities of a plasticizer and processing aids.

4,153,590

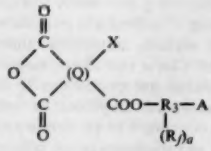
PERFLUOROALKYL SUBSTITUTED ANHYDRIDES AND POLYACIDS, AND DERIVATIVES THEREOF

Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 646,689, Jan. 5, 1976, Pat. No. 4,058,537. This application Aug. 29, 1977, Ser. No. 828,461
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—29.2 EP **9 Claims**

1. A method for improving the coating of substrates by a water based coating formulation of a water soluble, crosslinkable resin containing polyethylene oxide segments as water solubilizing units and being derived from diepoxides, said formulation containing an ionic fluorinated surfactant, which comprises adding an effective amount of a watersoluble or water-dispersible, resin-compatible product obtained by reacting

(a) an R_f containing anhydride of the formula I



(I)

wherein

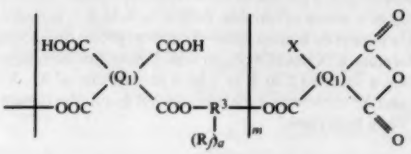
Q is a tetraradical of a tricarboxylic or tetracarboxylic acid selected from the group consisting of trimellitic acid, 3,3',4,4'-benzophenonetetracarboxylic acid and 1,2,4,5-benzenetetracarboxylic acid,

X is hydrogen or carboxy;

R_f is perfluoroalkyl of 6 to 18 carbon atoms;

a is 1 or 2;

A is hydrogen or group II;

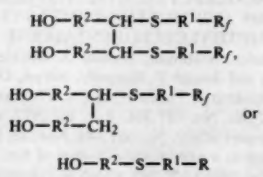


(II);

m is O;

Q_1 is the same as Q, and

R_3 is the residue of an R_f substituted aliphatic alcohol or diol of the structure



where R_1 is a branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 4 to 12 carbon atoms, alkyleneoxyalkylene of 4 to 12 carbon atoms or alkyleneiminoalkylene of 4 to 12 carbon atoms where the nitrogen atom contains as the third substituent hydrogen or alkyl of 1 to 6 carbon atoms; and

R_2 is straight or branched chain alkylene of 1 to 12 carbon atoms or an alkylenepolyoxyalkylene of the formula C_nH_{2n} $COC_kH_{2k})_r$ where n is 1 or 12, k is 2 to 6 and r is 1 to 40; with

(b) a tertiary amine containing compound selected from the group consisting of N,N-dimethylaminoethanol; N-methyldiethanolamine; 3;1 **-dimethylamino-**1-propanol; 1-dimethylamino-2-propanol; and N,N-bis(2-hydroxypropyl)aniline; in the ratio of one mole of the tertiary amine containing compound (b) used for each mole of anhydride group of R_f containing compound (a); with the mol ratio of carboxy/R_f groups in the product being 1 to 4; to said formulation.

4,153,591

COATING COMPOSITION FOR THICK COATING

Akitoshi Yoshida, Chiba; Masaharu Kosaka, Ichikawa, and Shigeki Inoue, Funabashi, all of Japan, assignors to Kikusui Kagaku Kogyo Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 526,409, Nov. 22, 1974, Pat. No. 4,002,590. This application Jul. 9, 1976, Ser. No. 704,103
Claims priority, application Japan, Nov. 27, 1973, 48/132212
Int. Cl.[2] C08L *25/14*
U.S. Cl. 260—29.6 S 3 Claims

1. A coating composition for thick coating in an amount of from 1 to 20 kg/m^2 comprising a coating liquid containing water, aqueous silica sol, an aqueous dispersion of an organic polymer selected from the group consisting of styrene-butyl acrylate copolymer and ethylenevinyl acetate copolymer and an aggregate, wherein said coating liquid contains from 5 to 40% by weight as SiO_2 of colloidal silica, 3 to 40% by weight of said polymer, a SiO_2/M_2O mole ratio, wherein M is an alkali metal atom selected from the group consisting of Na, K and Li, of from 7 to 2000 and a viscosity lower than 100 c.p. at 20° C. when kept in a sealed state at 50° C. for 10 days.

4,153,592

METHOD OF PREPARING A COATING COMPOSITION

Gary L. Burroway, Doylestown, and Michael J. Maximovich, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 680,818, Apr. 28, 1976, Pat. No. 4,064,092, which is a continuation of Ser. No. 529,829, Nov. 4, 1974, abandoned. This application Aug. 23, 1977, Ser. No. 827,196
The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.
Int. Cl.[2] C08F *6/14, 8/30*
U.S. Cl. 260—29.6 N 4 Claims

1. A method of preparing a coating composition which comprises (i) mixing and reacting a sufficient amount of a volatile amine with a water reducible composition comprised of an admixture or solution of (a) an aqueous resin emulsion, (b) coalescing solvent and (c) plasticizer and (ii) mixing sufficient water therewith to form a stable dispersion or solution of said composition having a pH in the range of about 8 to about 14, where said water reducible composition comprises an admixture or solution of 100 parts of the said resin emulsion with about 50 to about 100 parts by weight of a coalescing solvent therefor comprising at least one solvent selected from ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, diethylene glycol monobutyl ether, diethylene glycol monoethyl ether acetate, diethylene glycol diethyl ether, ethylene glycol monomethyl ether acetate, methyl ethyl ketone, acetone, methyl propyl ketone and diacetone alcohol and about 5 to about 70 parts by weight of at least one compatible plasticizer characterized by having a melting point of about −40° C. to about 25° C., a boiling point of at least 95° C. and a solubility parameter of about 8 to about 16, where said resin, when in solid form, has a Ring and Ball softening point in the range of about 100° C. to about 300° C., and is prepared by the method which comprises free radical aqueous emulsion polymerizing, in an aqueous medium having a pH in the range of about 2 to about 7, or free radical organic solution polymerizing a monomer mixture which comprises, based on 100 weight percent of monomers

(1) about 70 to about 85 weight percent of at least one hard segment hydrophobic enhancing monomer selected from styrene, α-methyl styrene, acrylonitrile, vinyl toluene, methyl methacrylate, vinyl chloride and vinylidene chloride,

(2) about 15 to about 25 weight percent of at least one soft segment hydrophobic enhancing monomer selected from at least one acrylate selected from methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, laural acrylate, isodecyl methacrylate, butyl methacrylate, isobutyl methacrylate, at least one vinyl ether selected from ethyl, butyl, octyl, decyl and cetyl vinyl ether and/or at least one diene selected from 1,3-butadiene, isoprene and 2,3-dimethyl butadiene, provided that said dienes of monomer part (B) and said monomer part (A) vinyl chloride and vinylidene chloride are not mixed together and copolymerized, and

(C) about 3 to 10 weight percent of at least one hydrophilic enhancing organic acid selected from acrylic, methacrylic, fumaric, itaconic and maleic acid,

and where said volatile amine is selected from primary, secondary and tertiary amines having a melting point in the range of about −40° C. to about 25° C. and a boiling point in the range of about 50° C. to about 150° C.

4,153,593

FLUORESCENT INK COMPOSITION FOR JET PRINTING

Daniel M. Zabiak, Park Ridge, and Ki-Sup Hwang, Chicago, both of Ill., assignors to A. B. Dick Company, Niles, Ill.

Continuation of Ser. No. 524,778, Nov. 18, 1974, abandoned. This application Sep. 17, 1976, Ser. No. 724,385
Int. Cl.[2] C08L *25/14*
U.S. Cl. 260—29.6 ME 8 Claims

1. A fluorescent jet printing ink which is reflective under ultraviolet radiation comprising a water base and the combination of a fluorescent dye component dissolved in the water base in an amount up to 2% by weight and a fluorescent brightener which absorbs at a lower energy level than the fluorescent dye component and has a peak immersion wavelength close to the peak absorption layer of the fluorescent dye component and present in the dissolved state in an amount within the range of 0.05–5% by weight, a humectant present in an amount within the range of 2–30% by weight and a water soluble binder dissolved in the water base in an amount which, when based on the viscosity of the ink composition, does not exceed 20 centipoises and provides for a specific resistivity of less than 1000 ohm-cm and which does not interfere with the fluorescence of the fluorescent dye.

4,153,594

INSULATED GLASS AND SEALANT THEREFORE

Floyd Wilson, Jr., R.D. 1 Box 434A, Pleasant Valley Rd., Titusville, Mercer County, N.J. 05860

Continuation-in-part of Ser. No. 675,084, Apr. 8, 1976, Pat. No. 4,063,002, which is a continuation-in-part of Ser. No. 567,486, Apr. 14, 1975, abandoned. This application Dec. 12, 1977, Ser. No. 859,760
Int. Cl.[2] C08K *5/09*
U.S. Cl. 260—31.8 R 33 Claims

24. A plasticized cured composition for use as a sealant for insulated glass having a moisture vapor transmission rating of no greater than about 1 g/day, an elongation of at least about 100% and low volatility and consisting essentially of:

(A) about 20 to about 30 wt.% of a cured polyether;

(B) about 30 to about 45 wt.% of a plasticizing material, at least 50 wt.% of the plasticizing material being diisodecyl phthalate or ditridecyl phthalate or a mixture thereof;

(C) about 15 to about 30 wt.% of calcium carbonate or silicate filler or mixture thereof;

(D) about 1.5 to about 3 wt.% of silane glass adhesion promoter; and

(E) about 4 to about 6 wt.% of a thixotropic agent.

4,153,595

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 429,125, Dec. 28, 1973, abandoned. This application Sep. 9, 1977, Ser. No. 831,915
Int. Cl.[2] C08K *5/42*
U.S. Cl. 260—45.7 S 9 Claims

1. A flame retardant aromatic carbonate polymer composi-

tion comprising in admixture an aromatic carbonate polymer and 0.01 to about 10.0 weight percent based on the weight of the aromatic carbonate polymer of a metal salt of a halogenated (F, Cl, Br) methanesulfonic acid wherein said metal salt is selected from the group consisting of the alkaline earth metal salts selected from calcium, strontium or barium or mixtures thereof, or mixtures of said alkaline earth metal salts and alkali metal salts in which there is not less than one part of akaline earth metal salt for each two parts of alkali metal salt.

4,153,596

PERMANENTLY STABILIZED POLYMERS PRODUCED BY AFTER-TREATMENT WITH PIPERIDINE COMPOUNDS

Harald Oertel, Odenthal; Paul Uhrhan; Reinhard Lantzsch, both of Cologne; Ernst Roos, Odenthal; Dieter Arlt, Cologne, and Hans Schroer, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

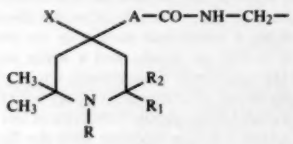
Filed Sep. 19, 1977, Ser. No. 834,764

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642461

Int. Cl.[2] **C08G** *18/38, 69/48, 63/76;* **C08F** *6/26*

U.S. Cl. 260—45.8 N **10 Claims**

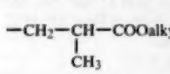
1. A permanently stbilised polymer having stabilising radicals attached to O- or N-atoms said radicals corresponding to the general formula (I-A):



(I - A)

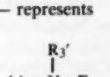
in which

R represents hydrogen, a straight-chain or branched alkyl radical with 1 to 20 carbon atoms, an alkenyl radical with 3 to 5 carbon atoms, an aralkyl radical with 7 to 12 carbon atoms, the group —CH— CHR_6—OH, where R_6 is hydrogen, methyl or phenyl, the group —CH_2—CH_2—CN, the group —CH_2—CH_2COOalkyl or the group



R_1 and R_2, which may be the same or different, each represents a straight-chain or branched alkyl radical with 1 to 6 carbon atoms or R_1 and R_2, together with the ring carbon atom to which they are attached, form a cycloalkyl ring with 5 to 7 carbon atoms,

—A— represents



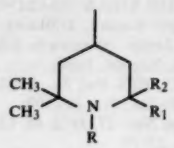
(a)

(b) —O—E—, or

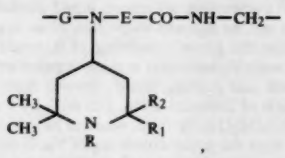
(c) —CO—NH—NH—;

in case (a), X in the general formula (I-A) represents hydrogen, in case (b), X represents hydrogen, the cyano group or a —$COOR_7$-group where R_7 is a methyl or ethyl radical, and in case (c), X represents the OH-group and

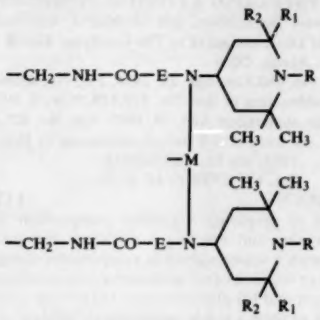
R_3' represents hydrogen, a straight-chain or branched alkyl radical with 1 to 20 carbon atoms, a cycloalkyl radical with 5 to 12 carbon atoms, an aralkyl radical with 7 to 12 carbon atoms, a β-cyanoethyl radical, a β-alkoxycarbonylethyl radical with 1 to 3 carbon atoms in the alkoxy moiety, an aryl radical with 6 to 10 carbon atoms, the group —CH_2—CH (R_6)—OH (in which R_6 represents hydrogen, methyl or phenyl), the group:



the group:



where G is an alkylene group with 2 to 6 carbon atoms, an aralkylene group with 8 to 10 carbon atoms or an arylene group with 6 to 8 carbon atoms, or the group:



or the group —E—CO—NH—CH_2— where M represents an alkane triyl group with 5 or 6 carbon atoms or an aralkane triyl group with 9 carbon atoms and where

E represents a C_1 to C_3-alkylene radical, the group —CH_2—$CH(R_6)$—O— (where R_6 is as defined above), the group —$(CH_2)_3$—NH—, the group —C_1 to C_3-alkylene—CO—NH—, the group —C_1 to C_3-alkylene—CO—NH—NH— or the group —CO—NH—NH or a single bond, the radical —CO—NH—CH_2— never being directly attached twice to the nitrogen atom in formula (a).

4,153,597

HINDERED PHENOLIC NITRO COMPOUNDS AS ANTIOXIDANTS

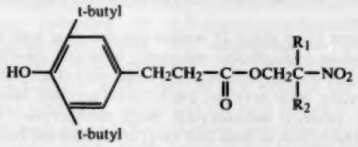
Edward L. Wheeler, Watertown, and Elmar H. Jancis, Naugatuck, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,011

Int. Cl.[2] **C08K** *5/32;* **C07C** *79/18*

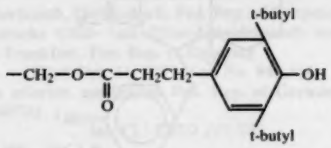
U.S. Cl. 260—45.85 B **18 Claims**

1. A compound of the formula

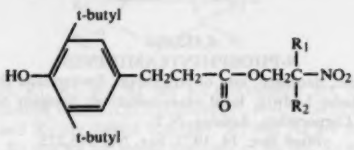


wherein R_1 and R_2 are each independently selected from the

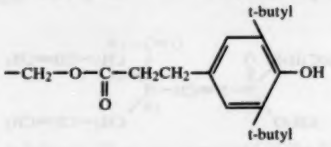
group consisting of linear or branched alkyl radicals having 1 to 6 carbon atoms and a radical of the structure



6. A composition comprising an organic material normally subject to oxidative deterioration and a stabilizing amount of a compound having the general formula



wherein R_1 and R_2 are each independently selected from the group consisting of linear or branched lower alkyls radicals having 1 to 6 carbon atoms and a radical of the structure



4,153,598

MONOAZO AND DIAZO COLORANTS FROM AMINOALKYLANILINES AND BIS(AMINOALKYL)ANILINES

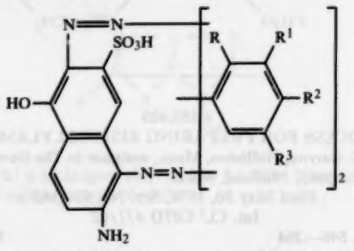
Nathan N. Crounse, Cincinnati, Ohio, assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 641,566, Dec. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 548,015, Feb. 7, 1975, abandoned. This application Aug. 4, 1977, Ser. No. 821,792

Int. Cl.[2] C09B *29/10, 29/38, 33/10, 33/16*

U.S. Cl. 260—185 **4 Claims**

1. A compound of the formula



wherein:

R is hydrogen, lower-alkyl, lower-alkoxy or halogen;

R^2 is hydrogen, lower-alkyl, lower-alkoxy or halogen; and

R^1 and R^3 are aminomethyl.

4,153,599

MONOAZO-DYES PARTICULARLY SUITED TO THE LEVELLED DYEING OF SYNTHETIC POLYAMIDE FIBERS

Enzo Rosati, Seregno (Milan), Italy, assignor to Aziende Colori Nazionali Affini -ACNA S.p.A., Milan, Italy

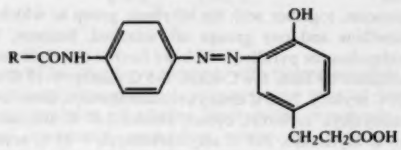
Division of Ser. No. 710,397, Aug. 2, 1976, Pat. No. 4,077,765. This application Sep. 30, 1977, Ser. No. 838,129

Claims priority, application Italy, Aug. 25, 1975, 26540 A/75

Int. Cl.[2] C09B *29/14;* **D06P** *1/39, 3/24*

U.S. Cl. 260—207 **1 Claim**

1. A compound of the formula:



wherein R is C_1–C_3 alkyl or phenyl.

4,153,600

PROCESS FOR THE RECOVERY OF ε-CAPROLACTAM FROM A DISTILLATION RESIDUE CONTAINING ε-CAPROLACTAM

Gerardus A. Geurts, Schaesberg, and Reijer Goettsch, Beek(L), both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Dec. 28, 1977, Ser. No. 865,338

Claims priority, application Netherlands, Jan. 12, 1977, 7700234

Int. Cl.[2] C07D *201/16*

U.S. Cl. 260—239.3 A **2 Claims**

1. Process for the recovery of ε-caprolactam from the residue remaining in the distillation of impure ε-caprolactam, characterized in that the residue is treated with sulphuric acid or oleum at a temperature of 80°–140° C., the resulting mixture is fully or partly neutralized, the lactam is extracted from the resulting mixture with an organic solvent, and the lactam is recovered in a known way from the solution thus obtained.

4,153,601

4-HYDROXYQUINOLONE-(2)-AZOMETHINE COPPER COMPLEX PIGMENTS

Terence R. Chamberlain, Stewarton; Colin D. Campbell, Beith, and James M. McCrae, Stewarton, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

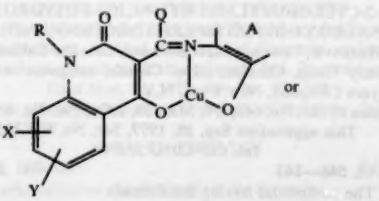
Filed Jun. 27, 1977, Ser. No. 810,247

Claims priority, application United Kingdom, Jun. 30, 1976, 27356/76

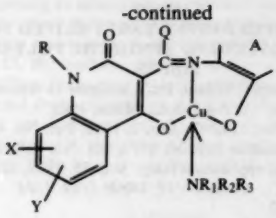
Int. Cl.[2] C07F *1/08;* **C07D** *215/06;* **C09D** *11/00;* **C09B** *57/00*

U.S. Cl. 546—7 **4 Claims**

1. An azomethine copper complex pigment of the formula



-continued



IA

wherein

A represents, together with the ethylenic group to which the azomethine and oxy groups are attached, benzene, benzimidazolone or pyridine which are further unsubstituted or substituted by halo, 1–6 C alkyl, 1–6 C alkoxy, 6–10 C aryl, 6–10 C aryloxy, 7–10 C aralkyl, trifluoromethyl, nitro, 2–7 C carboxyalkyl, carboxyl, cyano, amido, 2–7 C alkylamido, 6–10 C arylamido, 2–7 C alkylcarbamoyl, 7–11 C arylcarbamoyl, 1–6 C alkylsulphamoyl, 6–10 arylsulphamoyl, 1–6 C alkylsulphonylamino, or 6–10 C arylsulphonylamino;

R is hydrogen, 1–6 C alkyl, 6–10 C aryl or 7–10 C aralkyl;

Q is hydrogen or methyl;

X and Y are independently hydrogen, halogen, 1–6 C alkyl, 1–6 C alkoxy, 6–10 C aryloxy, 7–10 C aralkyl, trifluoromethyl or nitro, or X and Y together with the carbon atoms to which they are attached form a benzene ring;

R_1, and R_2 are independently hydrogen; alkyl of 1–22 carbon atoms which is unsubstituted or substituted by hydroxy, $—NH_2$ or cyano; and R_3 is hydrogen; alkyl of 1–22 carbon atoms which is unsubstituted or substituted by hydroxy, NH_2 or cyano; or aryl of 6 to 10 carbon atoms; or two or three of R_1, R_2, and R_3 form, together with the nitrogen to which they are attached, pyridine, quinoline of piperidine.

4,153,602
PROCESS FOR THE PREPARATION OF A N,N'-DIMETHYL-PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID DIIMIDE PIGMENT

Siegfried Schiessler, Frankfurt am Main; Ernst Spietschka, Oberauroff, and Reinhard Zunker, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 2, 1976, Ser. No. 654,295

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1975, 2504481

Int. Cl.[2] **C07D** *471/06;* **C09B** *5/62*

U.S. Cl. 546—37 **11 Claims**

1. In a process for preparing a pigmentary form of N,N'dimethyl-perylene-3,4,9,10-tetracarboxylic acid diimide by reacting perylene-3,4,9,10-tetracarboxylic acid anhydride with an excess of methylamine in aqueous solution in two steps, the improvement comprising: reacting said anhydride with a solution of at least a 4-fold molar amount of said amine at a temperature below 30° C., then heating the reaction mixture to a temperature of 70° to 150° C. and isolating the pigment.

2. N,N'-dimethyl-perylene-3,4,9,10-tetracarboxylic acid diimide pigment obtained by the process defined in claim 1.

4,153,603
(±)-2-CYCLOBUTYLMETHYL-9α,10β-DIHYDROXY-1β-(P-ALKOXY-BENZYL)PERHYDROISOQUINOLINE

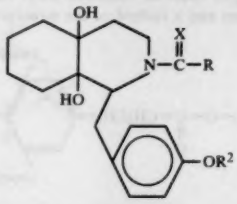
Ivo Monkovic, Candiac; Carol Bachand, Cote Ste-Catherine, and Henry Wong, Candiac, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 669,795, Mar. 23, 1976, Pat. No. 4,058,531. This application Sep. 28, 1977, Ser. No. 837,123

Int. Cl.[2] **C07D** *217/04*

U.S. Cl. 546—142 **3 Claims**

1. The compound having the formula



in which X is H_2, R^2 is (lower)alkyl of 1 to 6 carbon atoms and R is cyclopropyl or cyclobutyl.

4,153,604
N-PHOSPHINYLAMIDINES

Jörg Bader, deceased, late of Arlesheim, Switzerland (by Dagmar Bader-Ludwig, legal representative), assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

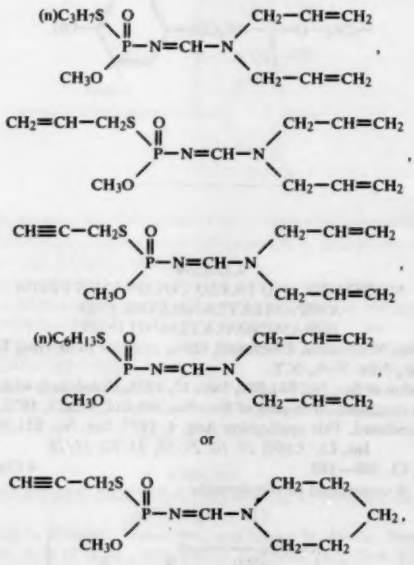
Filed Dec. 14, 1972, Ser. No. 315,273

Claims priority, application Switzerland, Dec. 17, 1971, 18553/71; Feb. 19, 1972, 1869/72

Int. Cl.[2] **C07D** *211/22, 211/24, 211/26;* **C07F** *9/40*

U.S. Cl. 546—22 **6 Claims**

1. A compound selected from the compounds of the formulae:



4,153,605
PROCESS FOR PREPARING BISPICOLYLAMINE

Philip E. Garrou, Holliston, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 30, 1978, Ser. No. 910,242

Int. Cl.[2] **C07D** *471/02*

U.S. Cl. 546—264 **8 Claims**

1. The process for preparing bispicolylamine comprising reacting by contacting with thorough mixing under autogenous or superatmospheric pressure (a) a cyanopyridine with (b) hydrogen in the presence of a catalytic amount of (c) a palladium on α-alumina catalyst.

4,153,606

PROCESS FOR THE PRODUCTION OF THIAZOLINE-(3) COMPOUNDS

Paul Scherberich, Dietzenbach, Fed. Rep. of Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

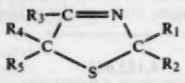
Filed Oct. 11, 1977, Ser. No. 840,714

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645731

Int. Cl.[2] C07D *277/08*

U.S. Cl. 260—306.7 R 14 Claims

1. A process for preparing a thiazoline-(3) compound of the formula

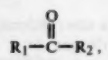


(I)

in which R_1, R_2, R_3, R_4 and R_5 individually are hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl or aralkyl or R_1 and R_2 are joined together, R_3 and R_4 are joined together, R_3 and R_5 are joined together or R_4 and R_5 are joined together and form with the carbon atom or atoms of the thiazoline ring to which they are connected a ring, said process comprising reacting (1) an oxo compound having a halogen atom on the carbon adjacent to the carbonyl group and having the formula

(II)

where X is halogen, (2) an oxo compound of the formula



(III)

(3) a metal or ammonium hydrogen sulfide and (4) ammonia.

4,153,607

PROCESS FOR THE PRODUCTION OF 4,5-DISUBSTITUTED THIAZOLES

Heinz Eilingsfeld, Frankenthal, and Guenther Seybold, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

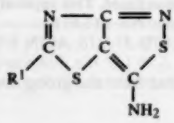
Filed Feb. 24, 1978, Ser. No. 880,883

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713573

Int. Cl.[2] C07D *417/02*

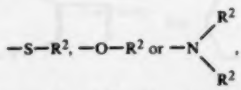
U.S. Cl. 260—306.8 F 12 Claims

1. A process for the manufacture of a 3-amino-thiazolo-(4,5-c)-isothiazole of the formula

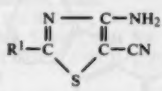


I

where R^1 is hydrogen, alkyl of 1 to 6 carbon atoms, aralkyl of 7 to 12 carbon atoms, phenyl,

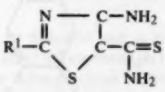


the individual radicals R^2 are identical or different and each is alkyl of 1 to 6 carbon atoms, aralkyl of 7 to 12 carbon atoms or phenyl, the two radicals R^2 present as substituents of the nitrogen atom may also form, together with the latter, a 5-membered or 6-membered heterocyclic ring, which in addition to the nitrogen atom may also contain an oxygen atom, wherein the above radicals and rings may in addition be substituted by alkyl or alkoxy each of 1 to 4 carbon atoms, which process comprises: in a first step, reacting a 4-amino-5-cyanothiazole of the formula



II,

where R^1 has the above meaning, with hydrogen sulfide in the presence of at least one basic compound selected from the group consisting of alkaline earth metal compounds, alkali metal compounds, ammonium compounds, tertiary amines, primary amines or secondary amines, and, in a second stage, cyclizing the resulting 4-amino-5-thiocarbamido-thiazole of the formula



III,

where R^1 has the above meaning, in the presence of a dehydrogenating agent.

4,153,608

ANTHRAQUINONE VAT DYESTUFFS

Walter Hohmann, Leverkusen, and Detlef-Ingo Schütze, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

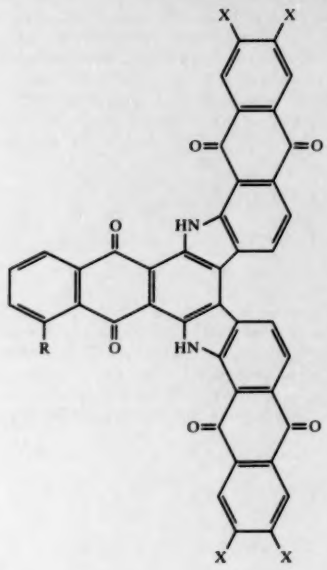
Filed Nov. 14, 1977, Ser. No. 851,308

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653644

Int. Cl.[2] C09B *5/26*

U.S. Cl. 260—316 2 Claims

1. Anthraquinone vat dyestuff of the formula



(I)

wherein

in each of the two anthraquinone radicals substituted by X, one X is chlorine and the other is hydrogen; and

R is hydrogen; benzoylamino, or benzoylamino substituted by C_1–C_4-alkyl, C_1–C_4 alkoxy or halogen.

4,153,609

3-INDOLYL-3-BIS-AMINO-PHENYL-PHTHALIDE COMPOUNDS

Jean C. Petitpierre, Kaiseraugst, Switzerland, and Robert Garner, Bury, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

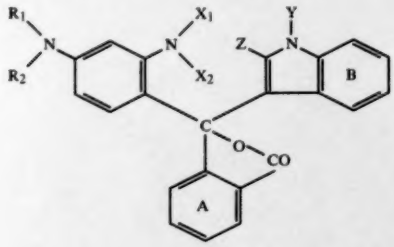
Filed Jan. 10, 1977, Ser. No. 758,259

Claims priority, application Switzerland, Jan. 16, 1976, 516/76

Int. Cl.[2] C07D *209/20*

U.S. Cl. 260—326.14 R **7 Claims**

1. A 3-indolyl-3-bis-aminophenyl-phthalide compound of the formula



(I)

wherein

R_1 represents alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, cycloalkyl, or unsubstituted or substituted phenyl or benzyl wherein the substituents are halogen, nitro, lower alkyl or lower alkoxy,

R_2 represents hydrogen, alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, cycloalkyl, or benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl lower alkoxy, or

X_1 and X_2 independently of one another represent hydrogen, lower alkyl, cycloalkyl, benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy, or acyl having 1 to 8 carbon atoms, and X_1 also represents phenyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy,

Y represents hydrogen, alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl or cyano, or benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy,

Z represents hydrogen, lower alkyl or phenyl, and the rings A and B independently of one another are unsubstituted or substituted by halogen, nitro, amino or lower alkylamino.

4,153,610

PROCESS FOR PRODUCING 5-CARBOXY-2-ACETYLTHIOPHENE

Toshihiko Hibino, Takarazuka, and Eiichi Murayama, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 1, 1977, Ser. No. 847,617

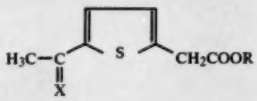
Claims priority, application Japan, Nov. 22, 1976, 51-140326

Int. Cl.[2] C07D *333/38*

U.S. Cl. 260—332.2 C **7 Claims**

1. A process for producing 5-carboxy-2-acetylthiophene which comprises either

(1) oxidizing a compound of the formula (III)



(III)

wherein X is oxygen or a conventional carbonyl-protecting group and R is hydrogen or a conventional ester residue, with a permanganate at a pH of 6 to 8 and a temperature of 0 to 100° C., and, if necessary, removing the carbonyl-protecting group, or

(2) oxidizing a compound of the formula (III) wherein X is a conventional carbonyl-protecting group and R is hydrogen or a conventional ester residue, with a permanganate at a pH of higher than 8 and a temperature of 0° to 100° C., and removing the carbonyl-protecting group.

4,153,611

SUBSTITUTED TETRAHYDROBENZOTHIOPHENES AND METHOD OF PREPARATION THEREOF

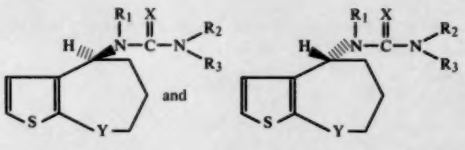
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 684,700, May 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 532,449, Dec. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 436,827, Jan. 25, 1974, abandoned. This application Jun. 5, 1978, Ser. No. 912,811

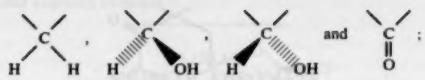
Int. Cl.[2] C07D *333/16*; A01N *9/00*

U.S. Cl. 260—332.3 P **22 Claims**

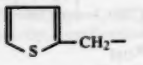
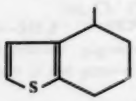
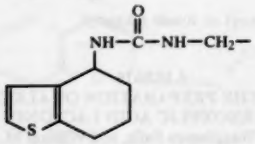
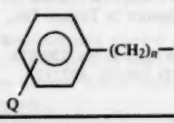
1. A compound selected from the group consisting of those of the formulae:



wherein X is oxygen or sulfur; Y is a divalent radical selected from the group consisting of those of the formulae:



R_1 is hydrogen or alkyl C_1–C_4; R_3 is selected from the group consisting of hydrogen, alkyl C_1–C_4, cycloalkyl C_3–C_6, allyl, 2-propynyl, benzyl and β-phenethyl; R_2 is selected from the group consisting of the substituents listed in the following table:

hydrogen
alkyl C_1—C_{12}
cycloalky; C_3—C_6
allyl
methallyl
2-butenyl
2-propynyl
hydroxy
alkoxy C_1—C_6
allyloxy
methallyloxy
2-butenyloxy
methoxymethyl
phenoxy
$-CH_2-CH_2-OH$
$-CH_2-CH_2-O-CH_3$
$-CH_2-CH_2-S-CH_3$
$-CH_2-CH(OR)_2$
$-CH_2-CF_3$
$-CH_2-CN$
$-CH_2-CO_2R$
$-NH-CO_2R$
$-\overset{O}{\overset{\|}{C}}-R$
$-\overset{O}{\overset{\|}{C}}-CCl_3$





wherein R is lower alkyl, n is 0, 1 or 2, and Q is selected from the group consisting of the substituents listed in the following table:

n = 0	n = 1	n = 2
2-methyl-4-bromo	hydrogen	hydrogen
	4-chloro	
3- or 4-methoxy	4-methoxy	
4-ethoxy		
4-chloro		
4-butoxy		
4-methylthio		
2,4-dimethyl		
2,4-dichloro		

-continued

n = 0	n = 1	n = 2
4-nitro		

4,153,612
2-BENZOXEPINS

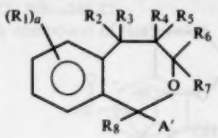
John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 847,350, Oct. 31, 1977. This application Dec. 7, 1977, Ser. No. 858,303

Int. Cl.[2] C07D *313/08, 313/10;* C07C *325/00*

U.S. Cl. 260—333 5 Claims

1. A compound having the formula



wherein

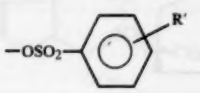
R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 or R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen;

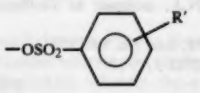
R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

and A′ is selected from the group consisting of $-(CH_2-)_mOCH_2CH_2B$ and $-(CH_2)_m-(OCH_2CH_2)_qB'$, wherein B is selected from the group consisting of halo, and



wherein R′ is selected from the group consisting of alkyl of from one to three carbon atoms, nitro, halo and trifluoromethyl;

B′ is selected from the group consisting of halo, hydroxy and



wherein R′ is the same as above, and m is one to three and q is two to three.

4,153,613

ACETALS AND KETALS OF ASCORBIC ACID AND ANTI-NITROSAMINE COMPOSITIONS AND METHODS USING SAME

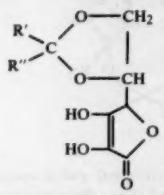
Kekhusroo R. Bharucha, Toronto; Charles K. Cross, Rexdale, and Leon J. Rubin, Toronto, all of Canada, assignors to Canada Packers Limited, Toronto, Canada

Division of Ser. No. 799,093, May 20, 1977. This application Jan. 23, 1978, Ser. No. 871,510

Int. Cl.[2] C07D *317/10*

U.S. Cl. 260—340.9 R **16 Claims**

1. Novel derivatives of ascorbic acid of the formula:



wherein R′ is hydrogen or a hydrocarbon group having from 1 to 7 carbon atoms and

R″ is alkyl or alkenyl of 6 to 20 carbon atoms, either straight or branched chain, with the proviso that the total number of carbon atoms in R′ and R″ is at least 10, or R″ is a hydrocarbon chain of one to fourteen carbon atoms substituted by a mono or bicyclic hydrocarbon radical wherein the ring or rings are 5 or 6 membered and wherein the ring or rings may each contain up to 3 alkyl or alkenyl substituents of from one to seven carbon atoms, and the edible salts thereof.

4,153,614

SYNTHESIS OF (S)-(+)-6-HYDROXY-2,5,7,8-TETRAMETHYLCHROMAN-2-METHANOL AND INTERMEDIATES THEREIN

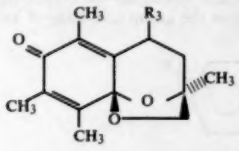
Richard Barner, Witterswil, and Max Schmid, Brugg, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 12, 1978, Ser. No. 905,361

Int. Cl.[2] C07D *317/10*

U.S. Cl. 260—340.9 R **1 Claim**

1. A compound of the formula:



IVA

wherein R_3 is hydroxy.

4,153,615

METHOD OF PRODUCING COLORING AGENTS

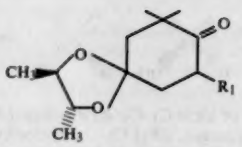
Gabriel Saucy, Essex Fells, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 27, 1978, Ser. No. 890,173

Int. Cl.[2] C07D *317/10*

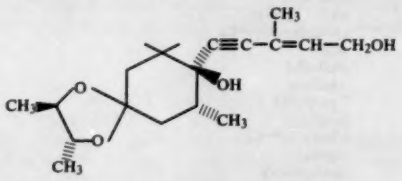
U.S. Cl. 260—340.9 R **8 Claims**

1. A compound of the formula

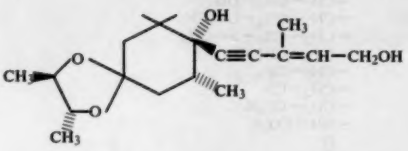


wherein R_1 is ▬CH_3 or ⫼ CH_3.

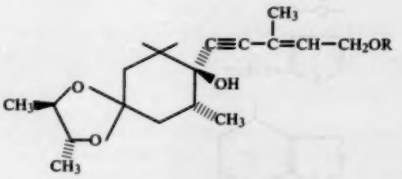
4. A composition selected from the group consisting of a compound of the formula



and mixtures thereof with a compound of the formula



7. A compound of the formula



wherein R is benzoyl or lower alkanoyl.

4,153,616

PROCESS FOR THE PREPARATION OF ALKENYLATED DICARBOXYLIC ACID LACTONES

Justin C. Powell, Wappingers Falls, and William M. Cummings, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,871

Int. Cl.[2] C07D *309/30, 307/32*

U.S. Cl. 260—343.5 **5 Claims**

1. A method for preparing an alkenyl-substituted acid lactone which comprises reacting maleic anhydride with an olefin having a molecular weight between 200 and 3000 under alkenylation conditions employing a temperature from 180° to 250° C. and a mole ratio of said maleic anhydride to olefin of from 1:2 to 3:1 to produce a reaction product comprising an alkenyl-succinic anhydride and a sludge, adding sulfuric acid and water to said reaction product to form a reaction mixture, said water being added in an amount between 1 and 2 times the stoichiometric amount of water required for hydrolysis of said anhydride to the corresponding acid, reacting said reaction mixture under lactonization conditions at a temperature in the range of 60° to 200° C. to form a second reaction product comprising an alkenyl-substituted acid lactone and a residue comprising said sludge and spent sulfuric acid catalyst, and

recovering said alkenyl-substituted acid lactone from said second reaction product.

4,153,617

ANOREXIC CHROMANS

Derek V. Gardner, Bishops Stortford, England, assignor to Beecham Group Limited, England

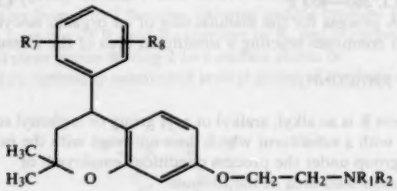
Division of Ser. No. 652,041, Jan. 26, 1976, Pat. No. 4,080,335, which is a continuation-in-part of Ser. No. 599,694, Jul. 28, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,948

Claims priority, application United Kingdom, Jul. 30, 1974, 33549/74

Int. Cl.² C07D *311/02*

U.S. Cl. 260—345.2 **4 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein R_1 is hydrogen, methyl or ethyl; R_2 is methyl or ethyl; R_7 is fluoro, chloro, methyl, methoxyl or trifluoromethyl; and R_8 is fluoro or chloro.

4,153,618

FLUORESCENT PIGMENTS

Nalin B. Desai, Bombay, India, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,198

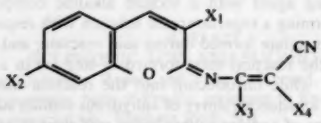
Claims priority, application Switzerland, Apr. 22, 1976, 5045/76

Int. Cl.² C07D *311/58*

U.S. Cl. 260—345.2 **5 Claims**

1. A fluorescent pigment consisting of N-substituted iminocoumarin of the general formula I,

(I)

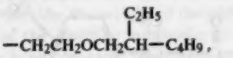


wherein

X_1 is an unsubstituted phenyl or naphthyl, or phenyl or naphthyl substituted by nitro, amino, halogen, lower alkyl or lower alkoxy, linked directly or through a —CO or $—SO_2$ group;

X_2 is (a) an amino group which is unsubstituted or mono- or di-substituted by lower alkyl or lower alkyl substituted by hydroxyl, nitrile, lower alkoxy, phenyl, phenylaminocarbonyloxy, phenoxy, halogen, lower alkoxycarbonyl, or acyloxy selected from benzoyloxy or acetyloxy; or by radicals

$—CH_2CH_2OCH_2CH_2OH$,



or $—CH_2=CH—CH_2$; or

(b) a hydroxy group or an alkoxy group;

X_3 is a hydrogen atom, a halogen atom or a cyano group and X_4 is a carboxylic acid group which has been esterified by lower alkanol, or a cyano group.

4,153,619

INTERMEDIATES FOR 2-NITRO-3-PHENYLBENZOFURAN ALKAN(AND-EN)OIC ACIDS

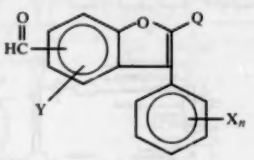
Robert A. Scherrer, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 806,526, Jun. 14, 1977, Pat. No. 4,124,704, which is a continuation-in-part of Ser. No. 724,717, Sep. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 616,277, Sep. 24, 1975, abandoned. This application Aug. 28, 1978, Ser. No. 937,073

Int. Cl.² C07D *307/82*

U.S. Cl. 260—346.22 **3 Claims**

1. A compound of the formula



wherein X is halogen, lower alkyl, lower alkoxy, nitro, phenyl, cyano or trifluoromethyl, n is zero, one or two, Y is methyl, methoxy, halogen or hydrogen and Q is hydrogen, bromine, iodine or nitro.

4,153,620

CERTAIN N-5-[4,7-DIMETHOXY)-6-(MONOALKYLAMINOETHOXY, MONOCYCLOALKYLAMINOETHOXY, OR DIALKYLAMINOETHOXY) BENZOFURANYL], N'-METHYL OR ETHYL UREAS

Guy R. Bourgery, Colombes; Alain P. Lacour, La Varenne; Bernard M. Pourrias, Meudon la Foret, and Genevieve C. Bregeon, Paris, all of France, assignors to Delalande S.A., Courbevoie, France

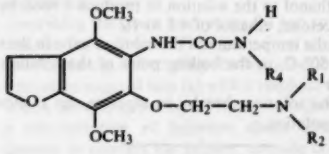
Division of Ser. No. 813,357, Jul. 6, 1977, Pat. No. 4,113,951. This application Jun. 12, 1978, Ser. No. 914,872

Claims priority, application France, Jul. 12, 1976, 76 21287; Jun. 27, 1977, 77 19658

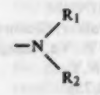
Int. Cl.² C07D *307/86*

U.S. Cl. 260—346.73 **7 Claims**

1. A compound having the formula



wherein R_4 is methyl or ethyl, and



is monoalkylamino wherein the alkyl has 1 to 3 carbon atoms, dialkylamino wherein the alkyls have 1 to 3 carbon atoms, or cycloalkylamino wherein the cycloalkyl has 5 to 6 carbon atoms.

4,153,621
GLYCIDYL ETHERS DERIVED FROM 3,3',5,5'-TETRAALKYL-4,4'-DIHYDROXYBIPHENYL

Ludwig A. Hartmann, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 689,157, May 24, 1976, Pat. No. 4,072,656. This application Sep. 1, 1977, Ser. No. 829,803

Int. Cl.[2] C08G *59/24*

U.S. Cl. 260—348.64 **2 Claims**

1. A glycidyl ether comprising the condensation product of a halohydrin and 3,3',5,5'-tetramethyl-4,4'-dihydroxy biphenyl.

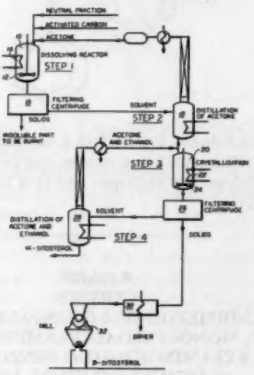
4,153,622
PROCESS FOR THE RECOVERY OF β-SITOSTEROL

Eero K. Lamminkari, and Lasse A. Koskenniska, both of Oulu, Finland, assignors to Medipolar Oy, Oulu, Finland

Filed May 18, 1978, Ser. No. 907,182

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.25 **13 Claims**



1. A process for recovery of β-sitosterol from the unsaponifiable or "neutral" fraction resulting from the manufacturing of soap by the sulfate pulp process, comprising the steps of:

a. suspending the neutral fraction together with activated carbon in acetone

b. raising the suspension temperature into the range of from about 40° C. to about the boiling-off point of the acetone in the mixture whereby a portion of the neutral fraction forms a solution with the acetone; thereafter

c. separating the solution from the insoluble part and the carbon; subsequently

d. adding ethanol to the solution to produce a ratio by volume of acetone; ethanol of 4:1 to 1:2

e. adjusting the temperature of the solution to be in the range of about 50° C. to the boiling point of the solution; and thereafter

f. cooling the solution thereby to separate out β-sitosterol from the solution.

4,153,623
PROMOTING PROPYLENE GLYCOL FORMATION WITH COMPOUNDS OF ALUMINUM

Leonard Kaplan, Charleston; Wellington E. Walker, Sissonville, and George L. O'Connor, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 11, 1977, Ser. No. 814,736

Int. Cl.[2] C07C *27/06, 31/06*

U.S. Cl. 260—449 L **5 Claims**

1. A process for producing alkane polyols in a homogeneous liquid phase mixture which comprises reacting at a temperature of from about 100° C. to about 375° C. and a pressure of from about 500 psia to about 50,000 psia hydrogen and oxides of carbon in the presence of a rhodium carbonyl complex and a compound of aluminum selected from the group consisting of aluminum carboxylates, trialkyl and triaryl aluminum compounds, aluminum alkanedionates, aluminum alkoxides, aluminum aryloxides and alkanolamine aluminates.

4,153,624
PREPARATION OF ORGANIC ISOCYANATES

William A. Fern, and Philip A. B. Rodriguez, both of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 31, 1978, Ser. No. 873,953

Claims priority, application United Kingdom, Feb. 3, 1977, 4452/77

Int. Cl.[2] C07C *118/00*

U.S. Cl. 260—453 P **7 Claims**

1. A process for the manufacture of an organic isocyanate which comprises reacting a substituted urea of the formula:

$$RNHCONH_2$$

wherein R is an alkyl, aralkyl or aryl group or is phenyl substituted with a substituent which does not react with the isocyanate group under the process conditions employed; or

a substituted urea of the formula:

$$H_2NCONHR^1NHCONH_2$$

wherein R^1 is hexamethylene or 2,4-tolylene;

with nitrous acid in the presence of a water-immiscible solvent and a phase transfer agent.

4,153,625
NEUTRALIZATION PROCESS

Brandon H. Barton, Cincinnati, and John A. Sagel, Mt. Healthy, both of Ohio

Filed Jul. 1, 1976, Ser. No. 701,724

Int. Cl.[2] C07C *141/00*

U.S. Cl. 260—457 **23 Claims**

1. In the process of nuetralizing an organic sulfuric or sulfonic acid or mixtures thereof in the presence of excess sulf(on-)ating agent the steps of:

(a) reacting said organic sulfuric or sulfonic acid and excess sulf(on)ating agent with a sodium alkaline component thereby forming a supersaturated solution with respect to the sodium sulfate formed during said reaction; and,

(b) cooling the reaction mass formed in step (a) in a heat exchanger while introducing into the reaction mass an amount of an aqueous slurry of anhydrous sodium sulfate, said amount of sodium sulfate being sufficient to reduce the deposition of sodium sulfate on the surfaces of the heat exchanger.

4,153,626
PREPARATION OF α-CYANOBENZYL ESTERS

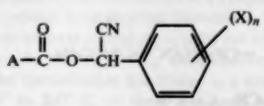
Charles H. Tieman, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 14, 1977, Ser. No. 860,507

Int. Cl.[2] C07C *121/66*

U.S. Cl. 260—465 D **18 Claims**

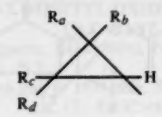
1. A process for the preparation of an α-cyanobenzyl ester having the formula I



I

wherein A is

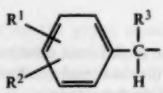
(a) a cyclopropyl group of formula II



II

wherein R_a and R_b each is an alkyl group having from 1 to 6 carbon atoms, a halogen atom having an atomic number of from 9 to 35, inclusive or when R_a is a hydrogen atom then R_b is an alkenyl group having from 2 to 6 carbon atoms optionally substituted by from 1 to 3 fluorine, chlorine and/or bromine atoms; R_c and R_d each is an alkyl group having from 1 to 6 carbon atoms or when R_c is a hydrogen atom then R_d is an alkenyl group having 1 to 6 carbon atoms optionally substituted by from 1 to 3 fluorine, chlorine and/or bromine atoms, or at least one of R_a and R_b together or R_c and R_d together is an alkylene group having 2 to 6 carbon atoms or

(b) an optionally substituted aralkyl group of the formula III



III

wherein R^3 is an alkyl, cycloalkyl or alkenyl group containing up to 4 carbon atoms and R^1 is a hydrogen atom, a halogen atom having an atomic number of from 9 to 53, inclusive, NO_2, CF_3, an alkyl group containing from 1 to 4 carbon atoms, and alkoxy group containing from 1 to 2 carbon atoms, an allyl group or a propargyl group and R^2 is a hydrogen atom or a methyl group; X is an alkyl, alkenyl, aralkyl or aryloxy group containing up to 10 carbon atoms; and n is an integar of from 1 to 3; which comprises contacting a carboxylic acid halide with a benzaldehyde cyanohydrin in the presence of a Lewis acid catalyst.

4,153,627

SULPHONIC ACID AND SULPHONATES

Pierre Delbende, Rouen, and Jean P. Heraud, Notre-Dame de Gravenchon, both of France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 14, 1977, Ser. No. 768,227

Claims priority, application United Kingdom, Feb. 20, 1976, 6775/76

Int. Cl.[2] C07C *143/24*

U.S. Cl. 260—505 P **20 Claims**

1. A process for improving the colour stability of an alkylaryl sulphonic acid comprising incorporating at least 1% up to about 10% by weight of an olefin having about 9 to 30 carbon atoms into the sulphonic acid or during the sulphonation process of producing said sulphonic acid wherein an alkylaryl compound is sulphonated by reaction with a sulphonating agent selected from the group consisting of sulphuric acid, oleum, gaseous sulphur trioxide, and a mixture of sulphur trioxide dissolved in sulphur dioxide followed by stripping to remove sulphur dioxide; the weight of the olefine being based on the weight of the resulting sulphonic acid, and wherein when said olefin is incorporated during the sulphonation process utilizing said mixture of sulphur trioxide dissolved in sulphur dioxide, said olefin is added before complete removal of sulphur dioxide by stripping and said olefin is not removed with the stripping of the sulphur dioxide.

4,153,628

WORKING UP SPENT SULPHURIC ACID SIMULTANEOUSLY WITH SULPHATE SALTS

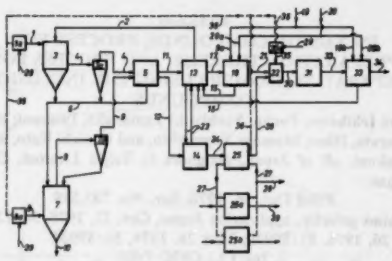
Rudolf Gerken, Krefeld; Hans Guth, Leverkusen; Christoph Mucke, Krefeld; Willi Potes, and Hermann Wieschen, Both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,465

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643798

Int. Cl.[2] C01B *17/90, 17/72, 17/50*

U.S. Cl. 423—531 **5 Claims**



1. A process for regenerating sulphuric acid from spent sulphuric acid containing metal sulphates in up to about 65% by weight and for the partial splitting of such sulphates, when present, into sulphuric acid, comprising:

a. in several stages hereof concentrating the spent acid with simultaneous dehydration of the metal sulphates in direct heat exchange in countercurrent flow with a portion of the hot gases containing sulphur trioxide from step (d) until a residue from the final concentration stage comprising an acid-sulphate mixture is obtained, the acid concentration in said mixture being about 98%,

b. transferring the acid-sulphate mixture from to final concentration stage to an evaporation stage and supplying thereto heating gases at a temperature from about 800 to 1200° C., thereby to produce substantially anhydrous sulphates and a gas containing sulphur trioxide and sulphur dioxide at a temperature up to about 450° C.,

c. transferring the anhydrous sulphates to a cleavage stage and supplying thereto, in a countercurrent flow, oxygen-containing heating gases at a reaction temperature of at most 600° C. to decompose the sulphates into sulphur trioxide and sulphur dioxide-containing cleaving gases and oxides,

d. combining the gases from steps (b) and (c),

e. transferring a portion of the gases from step (d) to step (a) and scrubbing and cooling the hot gases in the final concentration stage of step (a) with a sulphate-containing acid which has a temperature of from about 260 to 338° C. and a concentration of between about 92% and 98.3%, thereby to convert the sulphur trioxide contained in said gases to sulphuric acid while forming the acid-sulphate mixture of step (a), and generating a gascontaining water vapor and sulphur dioxide, which is sent to the other concentration stages prior to being sent step (g),

f. recovering the sulphur trioxide from the other portion of the gases from step (d) as sulphuric acid and passing the resulting sulphur dioxidecontaining gas to step (g),

g. converting the sulphur dioxide in the gas from (e) and (f) to sulphur trioxide by wet catalysis, and

h. passing the gas from step (g) to at least one of the concentration stages of step (a) before the final concentration stage.

4,153,629

9,10-DIHYDRO-9,10-METHANOANTHRACENE N-OXIDE

Hiroshi Tanida, Osaka, and Tadashi Irie, Suita, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,630
Claims priority, application United Kingdom, Dec. 15, 1975, 51318/75
Int. Cl.[2] C07C *87/28*
U.S. Cl. 260—570.8 TC 1 Claim

1. The compound 9-(3-dimethylaminopropyl)-9,10-dihydro-9,10-methanoanthracene N-oxide.

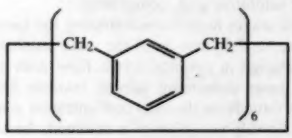
4,153,630

INCLUSION COMPOUNDS, PROCESS FOR PREPARATION THEREOF, AND PROCESS FOR SEPARATING ISOMERS USING THE INCLUSION COMPOUNDS

Yataro Ichikawa, Fuchu; Yoshiyuki Yamanaka, Iwakuni; Hideki Tsuruta, Hino; Mamoru Yamamoto, and Kenichi Kato, both of Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

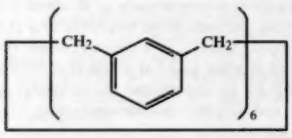
Filed Oct. 26, 1976, Ser. No. 735,549
Claims priority, application Japan, Oct. 22, 1975, 50/126259; May 26, 1976, 51/59930; May 26, 1976, 51/59931
Int. Cl.[2] C07C *7/00*
U.S. Cl. 260—578 13 Claims

9. A process for preparing an inclusion compound comprising contacting a meta-cyclophane represented by the formula



with at least one benzene derivative having substituents at 1- and 4-positions, or 1-, 2- and 4-positions as guest compounds.

12. An inclusion compound comprising a meta-cyclphane represented by the formula



and at least one benzene derivative included therein, said benzene derivative having substituents at the 1- and 4-positions, or at the 1-, 2- and 4-position.

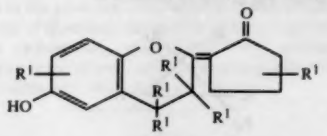
4,153,631

PROCESS FOR PROCESSING SILVER HALIDE DEVELOPING AGENTS

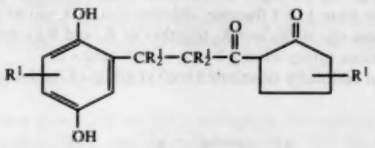
Henry Bader, Newton Center, and Charles E. Whitten, Winchester, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 5, 1977, Ser. No. 784,933
Int. Cl.[2] C07C *49/44*
U.S. Cl. 260—590 C 12 Claims

1. A process which comprises the step of hydrating a cyclized compound of the Formula:



in a medium comprising a mixture of water and a water miscible organic solvent where the water in said medium comprises from about 30% to about 60% by volume of the total volume of water and solvent, and an acid having a pKa between about 1.0 and about 3.0 in an amount sufficient to provide at least about 1 mole equivalent of acid per mole of cyclized compound to provide a compound of the Formula:



where R^1 can be the same or different substituent chosen from those substituents which do not impair the functionality of said compound as a silver halide developer.

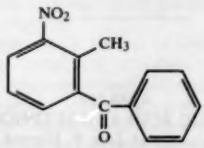
4,153,632

2-METHYL-3-NITROBENZOPHENONE

Thurairajah Padmanathan, Piscataway, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 736,663, Oct. 29, 1976, Pat. No. 4,065,477. This application Aug. 19, 1977, Ser. No. 826,209
Int. Cl.[2] C07C *49/76*
U.S. Cl. 260—591 1 Claim

1. The compound having the structural formula:



4,153,633

PROCESS FOR PREPARING METHYL HEPTENONE BY REACTION OF PRENYL-SUBSTITUTED METHYL PENTENONES WITH A POLY-FUNCTIONAL AMINE

Peter S. Gradeff, Andover, N.J., and Marshall R. Angeles, Rego Park, N.Y., assignors to Rhodia, Inc., New York, N.Y.

Filed Nov. 29, 1977, Ser. No. 855,575
Int. Cl.[2] C07C *49/20*
U.S. Cl. 260—593 R 34 Claims

1. A process for preparing methyl heptenone from a ketone mixture comprising prenyl-substituted methyl pentenones, which comprises reacting the ketone mixture with an amine having at least two functional groups, of which at least one group is an amine group and the other group is selected from the group consisting of another amine group, a hydroxyl group and an alkoxy group, at a temperature within the range from about 10° to about 250° C.; and then recovering methyl heptenone from the reaction mixture.

4,153,634

PROCESS FOR PREPARING METHYL HEPTENONE FROM PRENYL MESITYL OXIDE USING AN AMINE CATALYST

Stanley T. Murayama, Rocky Hill, N.J., assignor to Rhodia, Inc., New York, N.Y.

Filed Jul. 6, 1977, Ser. No. 813,381
Int. Cl.[2] C07C 49/04
U.S. Cl. 260—593 R 34 Claims

1. A process for preparing methyl heptenone from a ketone mixture comprising prenyl-substituted methyl pentenones, which comprises subjecting the ketone mixture to hydrolytic cracking with water in the presence of an aqueous solution of an amine catalyst having at least two functional groups of which at least one group is an amine group and the other group is selected from the group consisting of another amine group, a hydroxyl group and an alkoxy group, and having the formula:

$$[R—(A—Z)_m]_nNH_{3-n}$$

in which

m is a number from 1 to 10;

n is 1, 2 or 3;

Z is selected from the group consisting of aliphatic hydrocarbon, phenylene, cycloaliphatic hydrocarbon, aliphatic hydrocarbon-phenylene and aliphatic-cycloaliphatic hydrocarbon radicals having from one to about twenty carbon atoms;

A is selected from the group consisting of —NH and O; and

R is selected from the group consisting of hydrogen, alkyl having from one to about six carbon atoms, —R'NH_2 and —R'OH, where R' is alkylene having from one to about six carbon atoms

at a temperature within the range from about 10° to about 350° C., and recovering methyl heptenone from the hydrolytic reaction mixture.

4,153,635

PREPARATION OF CUMENE HYDROPEROXIDE

Ching-Yong Wu, O'Hara Township, Allegheny County; Harold E. Swift, Gibsonia, and John E. Bozik, Plum Borough, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 748,729, Dec. 9, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,291
Int. Cl.[2] C07C 179/04
U.S. Cl. 568—574 10 Claims

1. A process for oxidizing cumene to cumene hydroperoxide comprising heating cumene in contact with about 0.0005 to about 0.15 weight percent barium oxide at a temperature between about 90° C. and about 130° C. under substantially anhydrous conditions, contacting said cumene with molecular oxygen whereby said cumene is oxidized to cumene hydroperoxide, and continuing the oxidation reaction until the concentration of cumene hydroperoxide is at least about ten weight percent.

4,153,636

DEUTERATED ANALOGUES OF METHOXYFLURANE USEFUL AS AN ANESTHETIC

Leslie P. McCarty, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 17, 1977, Ser. No. 759,943
Int. Cl.[2] C07C 43/00, 43/12; A61K 31/08
U.S. Cl. 568—684 2 Claims

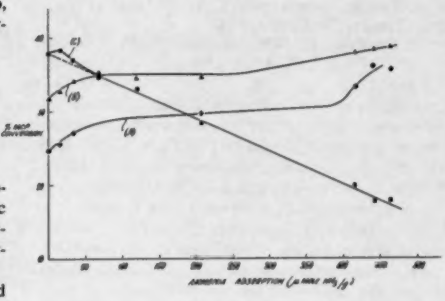
1. The compound 2,2-dichloro-1,1-difluoro-1-methoxy-d_3-ethane-d.

4,153,637

USE OF AMMONIA IN THE FORMATION OF AROMATIC HYDROCARBONS BY DEHYDROISOMERIZING ALKYLCYCLOPENTANE WITH A PLATINUM HYDROGEN MORDENITE CATALYST

Walter F. de Vleesschauwer, Ghent, and Alan Molyneux, Mariakerke, both of Belgium, assignors to s.a. Texaco Belgium n.v., Brussels, Belgium

Filed Dec. 23, 1977, Ser. No. 863,981
Claims priority, application United Kingdom, Feb. 22, 1977, 7294/77
Int. Cl.[2] C07C 5/24, 5/26, 5/32
U.S. Cl. 585—405 13 Claims



1. A process for the dehydroisomerization of alkylcyclopentane and hydrocarbon charge stocks containing alkylcyclopentane into aromatic hydrocarbons by contacting said alkylcyclopentane at an elevated temperature of at least 330° C. in the presence of hydrogen and a catalyst comprising a metal of Group VIII of the Periodic System supported on mordenite in hydrogen form treated with ammonia.

4,153,638

OLEFIN POLYMERIZATION PROCESS

Paul G. Bercik, Trafford; Harold E. Swift, Gibsonia, and Kirk J. Metzger, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 454,403, Mar. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 362,925, May 22, 1973, abandoned. This application Feb. 10, 1978, Ser. No. 876,757
Int. Cl.[2] C07C 3/10
U.S. Cl. 585—526 12 Claims

1. A process which comprises contacting a C_2–C_4 mono-olefin feed with a catalyst under polymerization conditions to include a temperature in the range of 250°–480° F., a pressure in the range of 400–1500 psig, and a space velocity in the range of 0.5 to 4.0 liquid weight hourly, said catalyst comprising:

a dried and calcined laminar 2:1 layer-lattice aluminosilicate mineral possessing layer-lattice unit cells, each cell having an inherent negative charge balanced by cations exterior to said unit cell, said mineral corresponding to the following overall formula prior to drying and calcining:

$$[(Al^{3+}_{4-ew}\ Y^{2+}_{3w})^{VI}(Q^{4+}_{8-x}Al^{3+}_{x})^{IV}O_{20}(OH)_{4-f}F_f]\cdot[dC^{Y}]$$

Where Y is selected from the class consisting of nickel, cobalt and mixtures thereof;

Q is at least 0.95 mol fraction silicon ions, the remainder consisting of tetravalent ions having an ionic radius not to exceed 0.65 A;

C is at least one charge-balancing cation; and where e has a numerical value from 2 to 3 inclusive;

w has a numerical value from 0.01 to 2 inclusive, with the

proviso that the quantity ew have a numerical value from 0.02 to 4 inclusive;

f has a value of 4 or less;

x has a numerical value from 0.05 to 2.0 inclusive;

y is the valence of the cation C;

d is the number of cations C where the product $dy=x+3(e-2)w$;

and recovering therefrom a low pour oligomer product having more than 75% by weight of the oligomer boiling above 200° F.

4,153,639

PROCESS FOR INTIMATELY BLENDING THERMOPLASTIC RESINS WITH ADDITIVES

Howard A. Vaughn, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 18, 1975, Ser. No. 597,150

Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—827 **11 Claims**

1. A process for producing a uniform blend of a thermoplastic polymer and an additive therefor, said process comprising:

(i) forming a mixture of said thermoplastic polymer, said additive, and a liquid medium which vaporizes readily;

(ii) feeding the mixture into contact with live steam flowing through a conduit and producing a mixture of fine droplets of the thermoplastic polymer, the additive, said liquid medium, condensed water and steam in said conduit;

(iii) introducing the mixture of step (ii) into an enclosed chamber adapted to permit removal overhead of said component which vaporizes readily, entrained condensed water and steam;

(iv) removing said component which vaporizes readily, condensed water, and steam from said chamber; and

(v) collecting the uniformly blended thermoplastic polymer and additive therefor in a discrete particulate form from said chamber.

4,153,640

MODIFIED POLYSILOXANES AND PROCESS OF PREPARING THEM

Hans Deiner, Neusass; Bernhard Sandner, and Willy Bernheim, both of Diedorf, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 3, 1977, Ser. No. 774,161

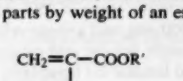
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608894

Int. Cl.[2] C08G *77/12, 77/20;* C08L *83/04*

U.S. Cl. 260—827 **11 Claims**

1. A process for the production of a modified polymer, comprising the step of reacting, at elevated temperature in the presence of a radical initiator, the following components:

(Ia) 70 to 99.9 parts by weight of an ester of the formula

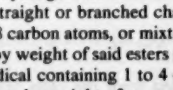


(Ia)

in which

R represents a hydrogen atom or a $-CH_3$ group and R' represents a straight or branched chain alkyl radical containing 1 to 18 carbon atoms, or mixtures thereof, wherein at least 50% by weight of said esters are those in which R' is an alkyl radical containing 1 to 4 carbon atoms,

(Ib) 0.1 to 20 parts by weight of an organic acid ester of the formula



(Ib')

in which

R represents a hydrogen atom or a $-CH_3$ group and R^2 represents

$$-(CH_2)_n-OH \text{ or } -(CH_2)_m-O-(CH_2)_m-OH,$$

in which

n is 2, 3 or 4 and

m is 2 or 3

or of the formula

$$R^3OOC-CH=CH-COOR^2 \qquad (Ib'')$$

in which

R^3 represents a hydrogen atom or an alkyl radical containing 1 to 12 carbon atoms, and

R^2 is as defined above,

or mixtures of organic acid esters of formulas (Ib') and (Ib''),

(Ic) 0 to 10 parts by weight of other monomers capable of copolymerising with components of formula (Ia), the sum of the components (Ia), (Ib) and (Ic) amounting to 100 parts by weight, in the presence of

(II) 5 to 40 parts by weight of a terminal-blocked alkylhydrogen polysiloxane which has a viscosity in the range from 20 to 1000 cP at 20° C., and in which the alkyl radicals contain 1 to 4 carbon atoms, and the ratio between the silicon-bonded alkyl radicals and the silicon-bonded hydrogen atoms is in the range from 13:1 to 1:1, in which ratios the terminal groups are not included.

4,153,641

POLYSILOXANE COMPOSITION AND CONTACT LENS

William G. Deichert, Macedon; Kai C. Su, and Martin F. van Buren, both of Webster, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 818,783, Jul. 25, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 878,831

Int. Cl.[2] C08L *43/04, 83/00*

U.S. Cl. 260—827 **29 Claims**

1. A fillerless, hydrolytically stable, biologically inert, transparent, contact lens with the capability of transporting oxygen sufficiently to meet the requirements of the human cornea comprising a poly(organosiloxane) monomer α,ω terminally bonded through divalent hydrocarbon groups to polymerized, free radical polymerizably activated, unsaturated groups forming a polymer in a cross-linked network.

4,153,642

RUBBER COMPOSITIONS COMPRISING DIBROMOPOLYBUTADIENE AND A SOLID POLYAMIDE

Charles E. Williams, Bloomfield Hills, Mich., assignor to Grow Chemical Corp., New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,204

Int. Cl.[2] C08L *9/00, 63/10, 77/06*

U.S. Cl. 260—837 R **14 Claims**

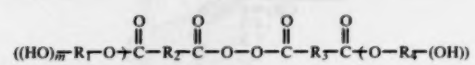
1. A one package rubber composition consisting essentially of a mixture of dibromopolybutadiene and an effective catalytic amount of the reaction product of a saturated aliphatic polyamine and a saturated aliphatic carboxylic acid or anhydride or an wherein or cycloaliphatic acid or anhydride where the reaction product is an amide that is solid at ambient temperature and pressure.

4,153,643
GRAFT COPOLYMERS FROM UNSATURATED MONOMERS AND PEROXY DI-ESTER POLYOLS AND POLYURETHANES PREPARED THEREFROM

Frank J. Preston, Meriden; Theodore C. Kraus, Cheshire, and Kiran B. Chandalia, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 18, 1977, Ser. No. 843,104
Int. Cl.[2] C08L *25/04*
U.S. Cl. 260—861 **22 Claims**

1. In a process for the preparation of graft copolymer polyols which comprises polymerizing an ethylenically unsaturated monomer or mixtures of such monomers in a polyol, the improvement characterized by polymerizing the unsaturated monomer in a polyol comprising a peroxy di-ester polyol of the formula:



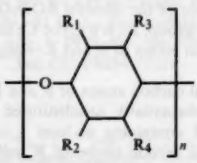
wherein m and r independently represent integers from 1–5, R_2 and R_3 independently represent radicals selected from aryl and alkenyl of 2–5 carbon atoms, and $((HO)_m—R_1—O)$ and $(O—R_4—(OH)_r)$ independently represent residues of polyols $R_1(OH)_{m+1}$ and $R_4(OH)_{r+1}$, wherein R_1 and R_4 independently represent polyether or polyester chains, having an average equivalent weight ranging from about 250 to 5000, after removal of one hydroxy hydrogen therefrom; said polymerizing occurring at a temperature at or above which the peroxy linkages of the peroxy di-ester polyol are ruptured.

4,153,644
RESIN COMPOSITION CONTAINING POLYPHENYLENE OXIDE

Akitoshi Sugio, Omiya; Masanobu Masu, Tokyo; Masaharu Kimura, Tokyo; Norio Sayama, Tokyo; Keiun Ko, Minoo, and Eiichi Yonemitsu, Kashiwa, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 640,776
Claims priority, application Japan, Dec. 26, 1974, 49-148445; Dec. 26, 1974, 49-148446
Int. Cl.[2] C08L *53/02*
U.S. Cl. 260—876 B **16 Claims**

1. A resin composition containing a polyphenylene oxide, comprising (A) a polyphenylene oxide having the following formula and having a molecular weight of 10,000 or higher:



wherein R_1 and R_2 are lower, straight chain alkyl groups of 1–4 carbon atoms; each of R_3 and R_4 is a hydrogen atom or has the same meaning as defined above for R_1 and R_2; the α-carbon atom in each R_1, R_2, R_3 and R_4 is not tertiary;

n is an integer such that the molecular weight is 10,000 or more; (B) a modified aromatic hydrocarbon formaldehyde resin, which is obtained by reacting an aromatic hydrocarbon formaldehyde resin with a phenol in the presence of an acid catalyst, the weight ratio of said resin (A) to said resin (B) being from 10:90 to 99:1, and (C) a styrene-butadiene or styrene-butadiene-styrene block copolymer, the amount of (C) being from 3 to 40 parts by weight per 100 parts by weight of total amount of the resin (A) and the resin (B).

4,153,645
HIGH-IMPACT POLYSTYRENE AND PROCESS FOR THE PRODUCTION THEREOF

Emmanuel Lanza, Brussels, Belgium, assignor to Labofina S. A., Brussels, Belgium

Continuation-in-part of Ser. No. 778,113, Mar. 16, 1977, abandoned, which is a continuation of Ser. No. 577,924, May 15, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 914,766
Int. Cl.[2] C08L *9/06*
U.S. Cl. 260—876 R **24 Claims**

1. A high impact polystyrene composition with improved physical properties, comprising a blend of:

a. from about 50 to 85% by weight of a diene rubber-modified polystyrene graft copolymer, produced by a mass-suspension polymerization process, having a small rubber particle size S of from about 0.2 to 0.9 microns and a superstrate to substrate ratio of from about 65–125:100; and,

b. from about 15 to 50% by weight of a diene rubber-modified polystyrene graft copolymer, produced by a mass-suspension polymerization process, having a larger rubber particle size L of at least about 0.9 microns and a superstrate to substrate ratio of from about 140–180:100, L being at least 1.5 times S.

4,153,646
GRAFT COPOLYMERS

Ulrich Steffen, Leverkusen; Heinrich Alberts, Cologne, and Richard Prinz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,119
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656228
Int. Cl.[2] C08F *263/04*
U.S. Cl. 260—878 R **4 Claims**

1. A graft copolymer consisting essentially of

(A) from 10 to 80%, by weight, of an ethylene/vinyl ester copolymer having a vinyl ester content of from 1 to 75%, by weight;

and, grafted thereon,

(B) from 90 to 20%, by weight, of a monomer mixture consisting of

(I) from 5 to 50%, by weight, of acrylonitrile and/or methacrylonitrile;

(II) from 94.9 to 35%, by weight, of an aromatic monovinyl compound;

and

(III) from 0.1 to 15%, by weight, of an optionally N-substituted acrylamide and/or methacrylamide;

the sum of (A) and (B) being 100%, by weight.

4,153,647

PROCESS FOR PRODUCING-IMPACT POLYSTYRENE

Vladimir S. Glukhovskoi, ulitsa Tsiolkovskogo, 7/2, kv. 33; Fedor P. Afanasov, pereulok Prokhladny, 16; Valentin P. Shatalov, ulitsa Geroev Stratosfery, 1, kv. 4; Alexandr G. Kharitonov, ulitsa Perevertkina, 28, kv. 39; Ervin M. Rivin, Leninsky prospekt, 17, kv. 44; Jury S. Tsybin; Klavdia A. Kulakova, both of ulitsa Nikitinskaya, 19, kv. 22, all of Voronezh; Boris A. Dolgoplosk, Vystavochny pereulok, 3, kv. 36; Valerian M. Sobolev, naberezhnaya M. Gorkogo, 46/50, kv. 185, both of Moscow; Valery P. Kotov, ulitsa Karla Marxa, 72, kv. 9, Voronezh; Vasily V. Polyakov, Leninsky prospekt, 10, kv. 4, Voronezh; Anatoly P. Garshin, ulitsa Bolshaya Manezhnaya, 2, kv. 41, Voronezh; Vyacheslav G. Fil, Leninsky prospekt, 12, kv. 19, Voronezh; Stanislav V. Efremov, Leninsky prospekt, 10, kv. 31, Voronezh; Ivan P. Mitin, ulitsa Rostovskaya, 46/6, kv. 7, Voronezh; Vasily F. Kozlov, ulitsa Koltsovskaya, 17, kv. 47, Voronezh; Anna R. Gantmakher, Scherbakovskaya ulitsa, 16/18, kv. 203, Moscow; Dmitry K. Polyakov, 11 Parkovaya ulitsa 44, korpus 3, kv. 34, Moscow; Alexandr A. Arest-Yakubovich, 11 Parkovaya ulitsa, 44, korpus 3, kv. 111, Moscow, and Raisa V. Basova, Izumrudnaya ulitsa, 38, kv. 17, Moscow, all of U.S.S.R.

Filed Jun. 15, 1977, Ser. No. 806,707
Int. Cl.[2] C08F *279/02*
U.S. Cl. 260—880 R 9 Claims

1. A process for producing high-impact polystyrene comprising polymerization of styrene in the presence of a strengthening agent selected from the group consisting of a conjugated diolefin polymer or a random copolymer, graft-copolymer, or block copolymer of a conjugated diolefin with styrene, mixtures thereof, and an anionic catalyst selected from the group consisting of a catalyst based on organic derivatives of alkali metals and adducts thereof, in a medium of hydrocarbon solvents selected from the group consisting of aliphatic, cycloaliphatic, aromatic solvents or mixtures thereof, cross-linking the polymer in the solvent media, after polymerization, by means of redox systems.

4,153,648

THERMOPLASTIC NITRILE RESIN BLENDS

George S. Li, Aurora, and John F. Jones, Cuyahoga Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 28, 1977, Ser. No. 846,289
Int. Cl.[2] C08L *23/00, 33/00*
U.S. Cl. 260—896 8 Claims

1. The blend composed of 100 parts by weight of

(I) a polymer prepared by the polymerization of 100 parts by weight of

(A) from 50 to 90% by weight of at least one nitrile having the structure

$$CH_2=C(R)-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

(B) from 10 to 50% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of

(1) styrene,

(2) an ester having the structure

$$CH_2=C(R_1)-COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(3) an alpha-olefin having the structure

$$CH_2=C(R')-R''$$

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

(4) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers, and

(5) vinyl acetate, and from 5 to 15 parts by weight of

(II) a polymer resulting from the copolymerization of

(A) from 50 to 90% by weight of at least one nitrile having the structure

$$CH_2=C(R)-CN$$

wherein R has the foregoing designation,

(B) from 10 to 50% by weight of indene, and

(C) from 0 to 40% by weight of an ester having the structure

$$CH_2=C(R_1)-COOR_2$$

wherein R_1 and R_2 have the foregoing designations.

4,153,649

PHOSPHATE ESTER-TYPE REACTION PRODUCT AND METHOD OF PREPARING SAME

Thomas J. Griffin, Jr., Sand Springs, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 656,675, Feb. 9, 1976, abandoned, and Ser. No. 656,676, Feb. 9, 1976, abandoned. This application Jul. 15, 1977, Ser. No. 816,113
Int. Cl.[2] C07F *9/02, 9/11*
U.S. Cl. 260—950 56 Claims

1. An organic phosphate ester composition having as a property the ability to increase the viscosity of kerosene when admixed in kerosene with sodium aluminate, said composition being prepared by the process which comprises the reaction of:

A. a pentavalent phosphorus compound selected from the group consisting of P_2O_5 and a mixture of P_2O_5 with polyphosphoric acid;

B. a hydroxy ether of the formula ROR_1OH wherein R is a C_1 to C_6 alkyl group, R_1 is a C_2 or C_3 alkylene group and the total carbon atoms of R and R_1 range from 3 to about 8; and

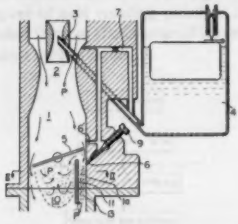
C. when the total carbon atoms of R and R_1 and is 3 or 4, a long chain substantially unsubstituted monohydric aliphatic alcohol containing at least 5 carbon atoms, but when the total carbon atoms of R and R_1 is 5 to 8, an alcohol selected from the group consisting of a long chain substantially unsubstituted monohydric aliphatic alcohol containing at least 5 carbon atoms, a short chain substantially unsubstituted monohydric aliphatic alcohol containing from 1 to 4 carbon atoms and a mixture of said alcohols,

the individual mole ratios of the hydroxy ether, the long chain alcohol and the short chain alcohol to total P_2O_5 being within the ranges of 0.4:1 to 4.5:1; 0:1 to 4.0:1 and 0:1 to 5.0:1 respectively, said reaction being conducted at temperature ranging from about 70° to about 90° C. for a period of time of from about 1.5 to about 6 hours, and said pentavalent phosphorus compound, hydroxy ether, and alcohol or alcohols being provided in molar ratios and admixed in a sequence effective to provide a reaction product suitable for use in increasing the viscosity of kerosene.

4,153,650
IDLING FUEL SUPPLYING SYSTEM OF A CARBURETOR

Kyo Hattori, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 16, 1977, Ser. No. 833,961
Claims priority, application Japan, Jun. 15, 1977, 52-70011
Int. Cl.[2] F02M 3/08
U.S. Cl. 261—41 D 4 Claims

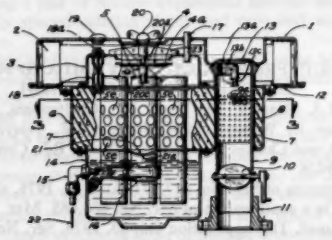


1. A carburetor for an internal combustion engine, said carburetor comprising:
- a vertically extending intake passage;
- a venturi in said passage;
- a chamber for containing fuel;
- a main nozzle in fluid communication with said fuel chamber, said nozzle opening directly into said venturi;
- a non-perforate throttle valve in said intake passage downstream of said venturi;
- an idle port in fluid communication with said fuel chamber, said port opening directly into said intake passage downstream of said throttle valve; and
- a straight vertically extending idling fuel deflecting wall for deflecting fuel from said idle port downwardly in said intake passage, said wall being in said intake passage below said throttle valve, the upper end of said wall being coextensive with said idle port, said wall extending well below said port in said passage, said wall defining with and within said intake passage a straight vertically extending second passage of substantially uniform transverse cross-sectional area and of substantially smaller transverse cross-sectional area than said intake passage whereby fuel from the idle port enters said second passage and flows downwardly through said second passage.

4,153,651
CARBURETION BY EVAPORATION AND OSMOSIS

Donald B. Mears, Jr., 31 Locke Dr., Enfield, Conn. 06082

Filed Aug. 4, 1978, Ser. No. 930,991
Int. Cl.[2] F02M 17/24
U.S. Cl. 261—55 17 Claims

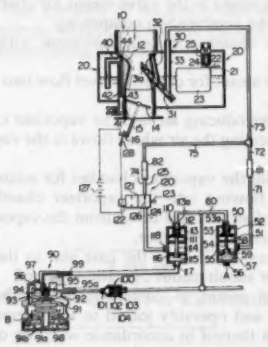


1. A carburetion system utilizing absorption, osmosis, and evaporation for energizing an engine comprising a lower liquid gasoline chamber having gasoline therein, an air chamber, an air intake valve, an inlet to said lower chamber from a source of liquid gasoline, an upper vapor chamber above said lower liquid chamber, a plurality of tube means open at each end thereof, absorbant material located in the lower portion of said tubes and in contact with said gasoline in said lower chamber, a wick circumscribing the interior surface of said tubes the length thereof, and in contact with said absorption material, a plurality of openings above the lower chamber in the periphery of said tubes, said upper vapor chamber having porous material surrounding the openings in said tubes therein, the upper portion of said tubes extending through said upper vapor chamber and in communication with the air intake valve, whereby the gasoline is absorbed in the absorption material and is carried by the process of osmosis in the wicks and whereby when air passes through the air valve and contacts the wicks in the tubes, the liquid gasoline changes into a vapor, and the vapor infiltrates the porous material in the vapor chamber through the opening in the tubes, said liquid gasoline evaporating when the air passes through the saturated wicks.

4,153,652
ALTITUDE COMPENSATING SYSTEM OF A CARBURETOR MOUNTED ON A VEHICLE

Tamotsu Ogita, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 26, 1977, Ser. No. 845,601
Claims priority, application Japan, Sep. 30, 1977, 52-116618
Int. Cl.[2] F02M 7/24
U.S. Cl. 261—121 B 10 Claims

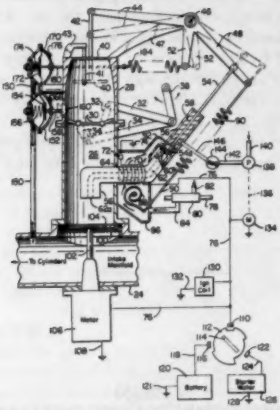


1. An altitude compensating system of a carburetor connected to an intake passage of an engine, the carburetor having a main jet and a throttle valve, for obtaining a desirable enriched air fuel ratio, which comprises:
- a means for enriching the air fuel ratio when the engine load is at least equal to a predetermined first value;
- an altitude compensating valve means for supplying compensating air in accordance with changes in altitude;
- a control valve means communicated with said altitude compensating valve means for permitting said compensating air to pass therethrough when the engine load is at least equal to a predetermined second value, and;
- a switching valve means disposed at a position between said control valve means and the main jet of a carburetor and interlocked with the throttle valve of said carburetor for switching said compensating air in response to the position of the throttle valve.

4,153,653
FUEL INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Jesse C. Moore, 309 S. Portland St., Celina, Ohio 45822

Continuation-in-part of Ser. No. 460,915, Apr. 15, 1974, Pat. No. 4,053,544. This application Oct. 11, 1977, Ser. No. 840,605
Int. Cl.[2] F02M 15/00
U.S. Cl. 261—157 14 Claims



1. Mechanism for introducing fuel into an internal combustion engine having an intake manifold, a housing having a vacuum chamber in communication with the intake manifold, the vacuum chamber having a principal passage for communication with the atmosphere, a gate movable with respect to the passage for opening and closing the principal passage, valve means within the vacuum chamber for controlling communication between the intake manifold and the principal passage, control means joined to the valve means for controlling operation thereof, the combination comprising:

a vaporizer chamber in communication with the vacuum chamber,

fuel control means for control of fuel flow into the vaporizer chamber,

means for introducing air into the vaporizer chamber,

means for heating the air which flows to the vaporizer chamber,

means within the vaporizer chamber for mixing the air and the fuel flowing into the vaporizer chamber so that a mixture of air and fuel flows from the vaporizer chamber into the vacuum chamber,

operator means joined to the gate and to the fuel control means for simultaneous operation thereof,

and control means in communication with the vacuum chamber and operably joined to the operator means for operation thereof in accordance with the degree of vacuum in the vacuum chamber.

4,153,654
POLYMERIC OPTICAL ELEMENT HAVING ANTIREFLECTING SURFACE

Kent N. Maffitt, Minneapolis; Hubert U. Brueckner, White Bear Lake, and Dean R. Lowrey, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

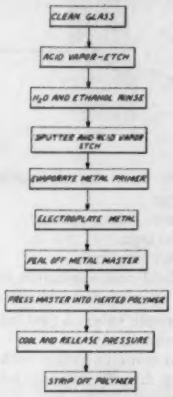
Division of Ser. No. 770,044, Feb. 18, 1977, Pat. No. 4,114,983. This application May 3, 1978, Ser. No. 902,430
Int. Cl.[2] B29D 11/00; C23C 15/00; C25D 1/10
U.S. Cl. 264—1 14 Claims

1. A method of forming an antireflecting surface on a polymeric optical element, said method comprising the steps of:

(a) providing a glass article having a uniform and homogeneous glass surface through which the transmission of visible light in a predetermined direction is at least 10^5 greater than the transmission measured 5° off the predetermined direction.

(b) vapor etching the homogeneous glass surface by exposing said surface of vapors of an acid to etch into the surface a plurality of peaks, a predominant number of which range in amplitude between approximately 10 and 50 nm, the ratio of visible light transmission in a predetermined direction to that transmitted 5° off the predetermined direction being substantially unchanged,

(c) sputter etching the acid etched surface with inert gas ions



to remove approximately 200–300 nm of the glass surface and to increase the amplitude of the peaks such that a predominant number thereof range in amplitude between 20 and 160 nm, the separation of adjacent peaks being not greater than three times the maximum amplitude of said peaks, and

(d) replicating the sputter etched surface into a surface of a polymeric material to form in the polymeric surface a replica of said plurality of peaks, whereby the total reflectance of visible light incident normal to said surface is less than 2%.

4,153,655
PRODUCTS FROM MOLTEN FLY ASH AND SCRUBBER SLUDGE INCLUDING FLY ASH

Leonard J. Minnick, 306 Boyer Rd., Cheltenham, Pa. 19012; William C. Webster, 3008 Potshop Rd., Norristown, Pa. 19403, and Charles L. Smith, 34 Corson Rd., Conshohocken, Pa. 19428

Continuation of Ser. No. 607,931, Aug. 30, 1975, abandoned, which is a continuation of Ser. No. 450,065, Mar. 11, 1974, abandoned. This application Jul. 23, 1976, Ser. No. 708,200
Int. Cl.[2] B01J 2/02
U.S. Cl. 264—8 1 Claim

1. Method of making a finely divided product from a fly ash composition consisting of heating said composition until a melt is formed and then pouring said melt onto a rotating mechanical member consisting of a plurality of horizontally disposed

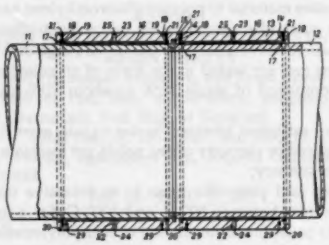
elements suspended between two circumferential supports in parallel vertical planes, the supports having a central bearing sleeve surrounding a horizontal axis about which the member rotates, said melt impinging upon the horizontal elements of said rotating mechanical member at a point in a 45° sector thereof bounded by top dead center and extending away from that point in the local direction of travel of said member at top dead center, said rotating member causing said molten fly ash composition to be thrown off in finely divided form in the direction of travel of said rotating member and hardening in said finely divided form in the course of travel through the air space surrounding said member.

4,153,656

PIPE JOINTS

Thomas W. Bunyan, London, England, assignor to Pilgrim Engineering Developments Limited, London, England

Filed Feb. 23, 1977, Ser. No. 771,091
Int. Cl.[2] B29C *27/00*; B29G *3/00*
U.S. Cl. 264—40.1 **6 Claims**



1. The automated method for forming a joint between a length of pipe and coupling sleeve radially spaced from said pipe, comprising:

placing a coupling sleeve about said length of pipe;

disposing a pair of hollow expandable annular members in axially spaced relation about said pipe and within said sleeve;

expanding said annular members by filling same with a first hardenable material to seal spaces between said pipe and said sleeve;

when the first hardenable material in said annular members reaches a predetermined pressure, automatically injecting a metered amount of a second and heat-hardenable material into an annular space between said pipe and said sleeve and between said annular members while venting air from said space through an air release valve which automatically closes as soon as some of the said second hardenable material flows through said valve;

thereupon applying additional pressure to said second hardenable material until said pressure reaches a desired value substantially above atmospheric pressure; and

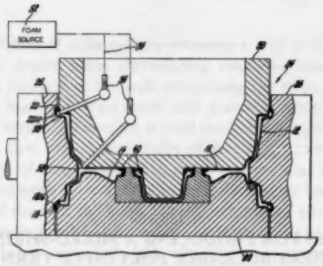
then automatically energizing a heater wire disposed in a groove of said sleeve to harden said second hardenable material and complete said joint.

4,153,657

METHOD FOR MAKING A VEHICLE WHEEL WITH A FOAMED RESIN CORE

Raymond J. Wilcox, 44 Via Casitas, San Luis Rey Downs, Calif. 92068

Continuation of Ser. No. 665,608, Mar. 10, 1976, abandoned, which is a division of Ser. No. 527,555, Nov. 27, 1974, Pat. No. 3,968,996. This application Oct. 31, 1977, Ser. No. 847,334
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—46.6 **6 Claims**



1. A method for making a vehicle wheel comprising: positioning a plurality of structural members to form an outer skin that defines a cavity having an annular rim portion and an interconnected disc portion with the cavity rim portion projecting from the cavity disc portion to opposite axial sides of the wheel, and injecting a foamable organic resin composition into the cavity for foaming and curing in situ so as to fill both the rim and disc portions of the cavity and to bond to the structural members within the cavity to thereby provide a load bearing and transmitting element.

4,153,658

Patent Not Issued For This Number

4,153,659

ENHANCING SOLVENT BARRIER PROPERTY OF PIGMENTED POLYMERIC BODIES

Gerald W. Recktenwald, Allentown, Pa., and Larry J. Hayes, Roanoke, Tex., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 1, 1977, Ser. No. 820,670
Int. Cl.[2] B29C *25/00*
U.S. Cl. 264—83 **10 Claims**

1. A process for improving the solvent barrier property of a pigmented article composed of a solid polymeric material,

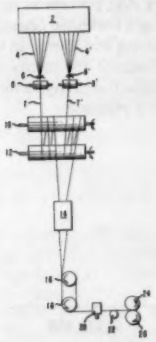
which process comprises pretreating pigment particles prior to incorporation into the polymeric material so as to remove trapped gas from the surfaces and interstices of the pigment particles, admixing the pretreated pigment particles with the polymeric material, forming the article from the mixture of pretreated pigment and polymeric material, and subjecting the pigmented article to a treatment with fluorine gas.

4,153,660

PROCESS FOR PRODUCING A MIXED-SHRINKAGE HEAT-BULKABLE POLYESTER YARN

Cecil E. Reese, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1977, Ser. No. 847,005
Int. Cl.[2] D01D *5/12*
U.S. Cl. 264—103 **8 Claims**



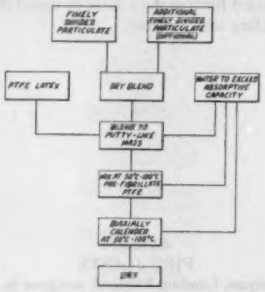
1. In the production of continuous-filament textile yarns by a continuous process wherein polyester filaments are melt-spun from spinneret orifices, quenched, converged into a filament bundle, and drawn with draw rolls to at least the natural draw ratio; the improvement for producing a mixed-shrinkage, heat-bulkable yarn which comprises melt-spinning filaments of ethylene terephthalate synthetic linear condensation polymer to form two filament bundles, applying a water-based spin finish to one filament bundle and applying a spin finish to the other filament bundle which contains less than 10 percent water and is substantially non-volatile at temperatures up to at least 130° C., drawing the separate bundles under identical treatment conditions during passage through a zone of dry heat, and then combining the drawn filament bundles before or on the draw rolls to intermingle the filaments and provide a mixed-shrinkage yarn.

4,153,661

METHOD OF MAKING POLYTETRAFLUOROETHYLENE COMPOSITE SHEET

Buren R. Ree, Stillwater; Louis A. Errede, North Oaks; Gary B. Jefson, St. Paul, and Bruce A. Langager, New Brighton, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 25, 1977, Ser. No. 827,785
Int. Cl.[2] B29D *27/00, 7/14;* **B29B** *1/04*
U.S. Cl. 264—120 **17 Claims**



1. A method of making high tensile strength polytetrafluoroethylene composite sheet material comprising:

(1) dry blending one or more types of particulate material;

(2) blending said particulate material with polytetrafluoroethylene particles in a weight ratio of about 3:1 to 50:1 particulate material to polytetrafluoroethylene particles to form a putty-like mass, wherein said polytetrafluoroethylene particles have a particle size in the range of 0.05 to 0.5 microns and are added in the form of an aqueous dispersion comprised of about 30% to about 70% by weight solids;

(3) adding sufficient lubricant water to said mass to exceed the absorptive capacity of the solids yet maintain a putty-like consistency;

(4) mixing said putty-like mass in an intensive mixer at a temperature between 50° C. and 100° C. for a time sufficient to cause initial fibrillation of said polytetrafluoroethylene particles;

(5) biaxially calendering said putty-like mass between calendering rolls maintained at about 50° C. to about 100° C. to cause additional fibrillation of said polytetrafluoroethylene particles to form a self-supporting sheet, while maintaining the water content of said mass at least at a level above the absorptive capacity of the solids and also closing the gap between the calendering rolls with each successive calendering operation, for a time sufficient to produce a high tensile strength sheet having a tensile strength of at least one megapascal; and

(6) drying the resultant sheet to remove water.

4,153,662

METHOD AND APPARATUS FOR FORMING A JEWELRY NEST

Theodore Descovich, Mahwah; Louis F. Donadio, Ringwood, both of N.J., and Anthony F. Cecere, Hicksville, N.Y., assignors to Avon Products, Inc., New York, N.Y.

Filed Jul. 9, 1976, Ser. No. 703,908
Int. Cl.[2] B29C *5/00, 24/00*
U.S. Cl. 264—227 **3 Claims**

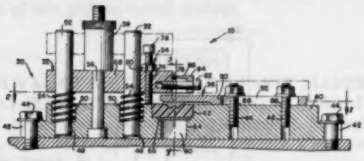
1. A method for use in forming a nest member having a nest cavity adapted to snugly yet removably receive a jewelry article or the like, comprising:

(a) impressing a master pattern having a raised configuration in a body to form an impression, said body comprised of a material before curing having a softness factor so that said

impression, while complementary to, corresponds substantially identically in contour with that of said master pattern;

(b) curing said body to acquire a hardness sufficient for retention of said impression;

(c) forming a layer of vulcanizable material into a mold member having a configuration complementary to contours of said body by engaging said layer with said body;



(d) vulcanizing at least said mold member so that said surface attains a contour substantially complementary to that of said impression in said body; and,

(e) casting said nest member in a mold comprising said vulcanized mole member and a second mold member whereby said nest cavity having the desired configuration is precisely formed therein.

4,153,663

METHODS FOR BENDING STRETCHED SYNTHETIC RESIN SHEETS

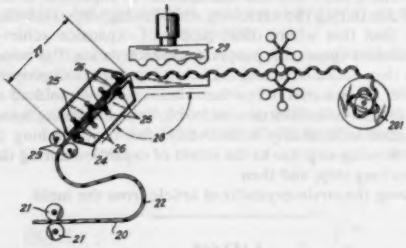
Heinz Vetter, Darmstadt-Arheilgen, and Ernst Friedrich, Darmstadt, both of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jul. 27, 1976, Ser. No. 709,079

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1975, 2535444

Int. Cl.[2] B29C *17/02*

U.S. Cl. 264—286 **4 Claims**



1. A method for bending a biaxially-stretched sheet of a thermoelastically deformable synthetic resin, which method comprises heating one side of said sheet in a first plurality of regions thereof and the other side of said sheet in a second plurality of regions different from said first plurality of regions, said regions extending across the entire breadth of the sheet and members of said first and second pluralities being adjacent and alternating, such that the softening temperature of the resin is exceeded on the heated side of the sheet and is not exceeded on the opposing side, and then bending the sheet in the heated portions with forming means and cooling the bent sheet, whereby a substantially sinusoidally-corrugated sheet is formed on bending.

4,153,664

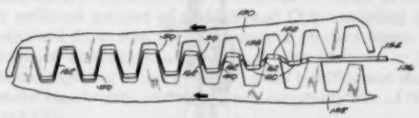
PROCESS FOR PATTERN DRAWING OF WEBS

Reinhardt N. Sabee, 728 S. Summit St., Appleton, Wis. 54911

Filed Jul. 30, 1976, Ser. No. 711,007

Int. Cl.[2] B29G *7/00*

U.S. Cl. 264—289 **20 Claims**



1. A method of differentially drawing a web with a quilted pattern of drawn areas surrounding undrawn islands to increase the strength of the web comprising the steps of providing a web having at least some cold drawable orientable thermoplastic material drawable at cold drawable temperature and providing first and second pairs of meshing gears having a tooth form of one of involute and cycloidal and a pressure angle of between 5° and 40° and a circular pitch less than the product of the web thickness times one hundred with the gear teeth providing rolling contact of the teeth at the pitch circles to provide incremental and simultaneous squeezing and stretching of the web at multiple points on the web between meshing teeth along a line of action for more than one tooth and the teeth of said second pair of gears being at a transverse angle relative to the teeth of the first pair of gears, moving a web through the first gear pair to provide parallel and alternate cold stretched and unstretched zones and moving the web through the second set of meshing toothed rollers at the speed of the teeth of the rollers to superimpose a second pattern on the web having alternate cold stretched and unstretched zones to provide generally quadrilaterally shaped undrawn islands bounded fully on each of their four sides by an axially drawn molecularly oriented area and each quadrilateral island being contiguous at each of its four apices to a biaxially drawn molecularly oriented area.

4,153,665

APPARATUS AND METHOD FOR FOLDING A SHEET OF MATERIAL

Camillo M. Vecchiotti, Ridgewood, and Bruce S. Goldberg, Clifton, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 726,263, Sep. 24, 1976, abandoned, which is a division of Ser. No. 535,980, Dec. 23, 1974, Pat. No. 4,002,417. This application May 24, 1978, Ser. No. 909,177

Int. Cl.[2] B29C *17/02*; B29D *23/10*

U.S. Cl. 264—295 **5 Claims**

1. A method for forming a sleeve about an elongated folding blade having four spaced fold lines, said blade having at least three heaters adjacent respective corners thereof, comprising:

(a) disposing a sheet of thermoplastics material upon a support table including an elongated anvil member and two rotatable fold plates spaced apart on opposite sides of said anvil member;

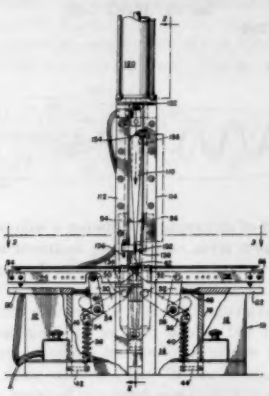
(b) engaging said thermoplastics sheet material between said anvil member and an elongated first heater characterized by two spaced corners;

(c) heating said sheet material with said first heater while said material is engaged between said first heater and said anvil member;

(d) bending the heated said sheet material about said spaced corners by rotating said fold plates, forming said material, about said first heater, into a channel having two sides;

(e) heating said sides locally along two regions spaced from

said first heater by two additional heaters of said three heaters;



(f) bending upper portions of each of said sides about corners defined by said two heaters thereby forming said sleeve.

4,153,666

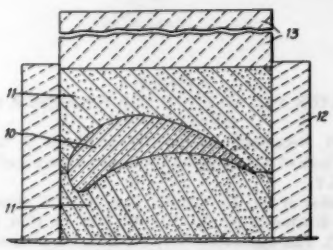
HOT-PRESSING OF SHAPES OF NON-UNIFORM CROSS-SECTIONAL THICKNESS

Richard A. Alliegro, Holden, Mass., assignor to Norton Company, Worcester, Mass.

Continuation of Ser. No. 213,124, Dec. 28, 1971, abandoned. This application Feb. 12, 1974, Ser. No. 441,737

Int. Cl.[2] B29C *3/00*

U.S. Cl. 264—325 **2 Claims**



1. A method of hot-pressing a refractory powder to a desired final shape of non-uniform thickness in cross-section by

(1) making a first article preform of the powder temporarily bonded to a first shape having a surface contour which when oriented in a mold and uniaxially compressed to final density will deform in a predetermined manner to assume a final predetermined shape having a surface contour different from the shape of said first article preform;

(2) hot-pressing said preform in a mold including a preformed matrix mold part having a surface exactly mating with a surface of the article preform, a compaction ration the same as that of the article preform, a coefficient of thermal expansion substantially equal to or greater than that of the article preform, and non-reactive with the article preform under hot-pressing conditions, such that upon completion of molding the article can be effectively separated from the matrix mold element, and the part has achieved its predetermined shape.

4,153,667

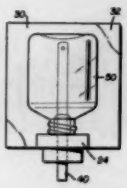
METHOD OF FORMING ARTICLES FROM THERMOPLASTIC MATERIALS

Thomas E. Brady, Sylvania, Ohio, and Nicholas J. Curto, Monroe, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 710,765, Jul. 30, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,613

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—532 **9 Claims**



1. In a method of blow molding a container, wherein a blowable preform of approximately 0.9 inherent viscosity polyethylene trephthalate material is expanded by a total expansion ratio of less than about nine, the step of:

heating a blowable preform of polyethylene terephthalate to a temperature in the range of from about 75° C. to about 110° C.;

enclosing the preform in a mold cavity;

while the preform is at a temperature conducive to molecular orientation, stretching the preform along its longitudinal axis to a length which is at least 2.6 times the original preform dimension along the longitudinal axis, the extent of stretch conditioning the material for the rapid onset of strain hardening during the subsequent blowing operation, and with the minimum extent of stretching being dependent upon the inherent viscosity of the material such that preforms of polyethylene terephthalate material having an inherent viscosity of less than 0.9 require slightly greater stretches;

introducing blow air under pressure into the interior of the stretched preform while the stretched preform is still at a temperature conducive to molecular orientation, to expand the preform to the size and configuration of the final container, the extent of expansion during the blow step being not greater than the extent of expansion during the stretching step, with the total amount of expansion of the preform during the stretching and blowing steps: (a) being less than that where other modes of expansion achieve equivalent improved property characteristics, (b) being less than about nine, and (c) achieving improved properties in the material over other modes of blow molding at the same total areal strain, and with strain hardening being initiated substantially immediately after the beginning of the blowing step due to the extent of expansion during the stretching step; and then

removing the strain-crystallized article from the mold.

4,153,668

MULTI-ZONE ANALYTICAL ELEMENT AND METHOD USING SAME

Doyle E. Hill, Fairport, and Karl J. Sanford, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,732

Int. Cl.[2] G01N *33/16*

U.S. Cl. 422—56 **15 Claims**

1. In a multi-zone analytical element for the detection of a proteinaceous or protein-bound analyte in an aqueous liquid, said element comprising

(1) a spreading zone to receive and distribute therewithin an applied sample of said aqueous liquid, and

(2) a reagent zone in fluid contact with said spreading zone under conditions of use of said element, said reagent zone

containing a composition interactive with said proteinaceous or protein-bound analyte to form a detectable species within said element,

the improvement wherein said spreading zone comprises an immobile polymeric material which (a) is substantially noninterfering with respect to said interactive composition and (b) contains charge-bearing functional groups, said groups under conditions of use of said element exhibiting an electric charge opposite to that of said proteinaceous analyte or the protein portion of said protein-bound analyte.

4,153,669

REMOVAL OF METALS FROM WASTE MATERIALS THAT CONTAIN BIMETALLIC SALT COMPLEXES

Donald A. Keyworth, Houston, and Jerome R. Sudduth, Pasadena, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jul. 11, 1978, Ser. No. 923,760
Int. Cl.[2] C01G *3/02, 7/34, 7/00, 5/00*
U.S. Cl. 423—24 **10 Claims**

1. The process for the removal of metals from waste materials that comprise a bimetallic salt complex component selected from the group consisting of complexes having the formula $M_IM_{II}X_n$.Aromatic; complexes having the formula $M_IM_{II}X_n$.M_{II}OX.Aromatic; and mixtures thereof, wherein M_I is a Group I-B metal, M_{II} is a Group III-A metal, X is halogen, n is the sum of the valences of M_I and M_{II} and Aromatic is a monocyclic aromatic hydrocarbon or halogenated aromatic hydrocarbon having 6 to 12 carbon atoms, and an organic component selected from the group consisting of monocyclic aromatic hydrocarbons having 6 to 12 carbon atoms, halogenated aromatic hydrocarbons having 6 to 12 carbon atoms, alkylated aromatic hydrocarbons, olefin oligomers, tars, and mixtures thereof that comprises the steps of

(a) contacting said waste material with water and sufficient alkali metal hydroxide to form a hydrolysis mixture having a pH above 5;

(b) allowing the hydrolysis mixture to separate into an upper organic phase and a lower aqueous phase that is a slurry of water-insoluble compounds selected from the group consisting of M_I oxide, M_I hydroxide, M_{II} hydroxide, and mixtures thereof; and

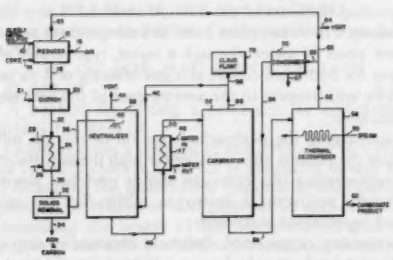
(c) separating the organic phase from the aqueous phase.

4,153,670

METHOD OF TREATING AN ALKALI METAL SULFIDE LIQUOR

Robert D. Rennick, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 723,389, Sep. 15, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,616
Int. Cl.[2] C01D *7/00;* **C10B** *17/16;* **D12C** *11/02*
U.S. Cl. 423—189 **6 Claims**



1. A method of treating an aqueous alkali metal sulfide-containing liquor to remove the sulfur values therefrom, said alkali metal being selected from the group consisting of sodium, potassium, rubidium and cesium, comprising the steps of:

(a) introducing said aqueous alkali metal sulfide-containing liquor, said liquor having a pH within the range of from about 12 to 14 and which contains a solute comprising at least about 60 mole % of said alkali metal sulfide, into a neutralization zone where it is intimately contacted and reacted at a temperature of from about 30° to 60° C. with a sufficient amount of an H_2S- and CO_2-containing gas obtained from step (d) to produce a product liquor of reduced alkalinity having a pH of from about 7.5 to 9.5 and comprising a slurry of alkali metal bisulfide and alkali metal bicarbonate, and an offgas substantially free of H_2S and CO_2;

(b) withdrawing a stream of the product liquor from step (a), cooling it to a temperature of from about 30° to 45° C., and introducing the cooled liquor into a carbonation zone;

(c) contacting the liquor in said carbonation zone with a sufficient amount of a CO_2-containing gas obtained from step (f) to produce a liquid product stream comprising a slurry of at least about 90 mole % alkali metal bicarbonate and less than about 10 mole % alkali metal sulfide, and a product gas comprising at least 30 volume % H_2S and from 8 to 20 volume % CO_2 on a dry basis;

(d) recovering the product gas from step (c) and introducing a part of it into step (a);

(e) recovering the liquid product stream from the carbonation zone in step (c) and thermally decomposing it at a temperature of from about 90° to 250° C. to produce a CO_2-rich offgas and a concentrated solution, which contains a solute comprising at least 51 mole % alkali metal carbonate and the balance of the solute being principally alkali metal bicarbonate; and

(f) recovering the CO_2-rich offgas from step (e), mixing it with a dilute CO_2-containing gas and introducing the mixture into the carbonation zone in step (c).

4,153,671

CATALYTIC GAS PURIFICATION PROCESS

Porter Clements, Whiting; Michael R. Basila, Munster, both of Ind., and James J. Barry, La Grange, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 13, 1977, Ser. No. 758,966
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—244 **4 Claims**

1. A process for purifying hydrogen-containing gases which contain carbon monoxide, olefins, hydrogen sulfide, and organic sulfur compounds which comprises adding a predetermined limited amount of water to such gases and passing the resultant gases into contact with a hydrogenation catalyst containing phosphorus under controlled temperature conditions within the range of 500°–750° F. and under superatmospheric pressures, the amount of water added being within the range of 1% to 10% by volume of the total gas mixture, and said hydrogenation catalyst containing one or more of the elements cobalt, nickel and molybdenum and 1% to 15% by weight phosphorus, calculated as P_2O_5, the conditions being such as to reduce the amount of organic sulfur compounds in said gas mixture and convert olefins to saturated hydrocarbons.

4,153,672

SYNTHESIS OF TETRADECAHYDROUNDECABORATE (−1) FROM BOROHYDRIDE ION

Gary B. Dunks, Los Angeles, Calif., and Charles D. Beard, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,757
Int. Cl.[2] C01B *35/18*
U.S. Cl. 423—287 **10 Claims**

1. A process for the preparation of a tetradecahydroundecaborate(−1) ion which comprises contacting in an inert,

non-aqueous solvent medium and at a temperature of from about 85° to about 135° C.,

(a) a tetrahydroborate having the formula:

MBH_4

wherein M represents an ion selected from the group consisting of sodium, potassium, lithium, cesium, rubidium or lower alkyl ammonium, with

(b) an alkyl halide of the formula:

RX

wherein R represents an alkyl group of from 1 to about 10 carbon atoms and X represents the chloride, bromide or iodide group.

4,153,673

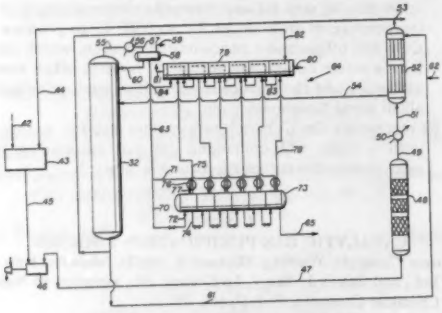
LOW ENERGY AMMONIA SYNTHESIS PROCESS

Colman L. Becker, Houston, Tex., assignor to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 729,459, Oct. 4, 1976. This application Oct. 3, 1977, Ser. No. 838,797

Int. Cl.[2] C01C *1/04*

U.S. Cl. 423—359 **7 Claims**



1. In an ammonia synthesis process wherein hydrogen and nitrogen are reacted at elevated pressure in an ammonia synthesis converter to produce ammonia, the improvement which comprises:

recovering the ammonia from the ammonia synthesis converter by water absorption which forms a water-ammonia mixture;

distilling said water-ammonia mixture in a distillation column to recover anhydrous ammonia;

flashing said ammonia by reducing the pressure of said ammonia recovered from said distillation column in stages whereby in each stage vapor is formed and the liquid ammonia cooled,

absorbing said vapor with water to form an aqua-ammonia mixture, and

distilling said aqua-ammonia mixture in the same distillation column as said water-ammonia mixture.

6. In an ammonia synthesis process wherein hydrogen and nitrogen are reacted at elevated pressure in an ammonia synthesis converter to produce ammonia, the improvement which comprises:

recovering the ammonia from the ammonia synthesis converter by water absorption which forms a water-ammonia mixture;

distilling said water-ammonia mixture in a distillation column to recover anhydrous ammonia;

flashing said ammonia by reducing the pressure of said ammonia recovered from said distillation column in stages whereby in each stage vapor is formed and the liquid ammonia cooled;

absorbing said vapor from the last flashing stage with water to form an aqua-ammonia mixture, and

absorbing said vapor from each preceding flashing stage with water said water being provided by the aqua-ammonia mixture formed in the subsequent absorption stage.

4,153,674

SULFUR RECOVERY FROM GASES RICH IN H_2S AND CO_2 AS WELL AS COS OR ORGANIC SULFUR

Jan Verloop; Rudolf C. Goetzee, and Erik S. E. Werner, all of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 7, 1977, Ser. No. 858,318

Claims priority, application United Kingdom, Dec. 7, 1976, 50996/76

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—573R **13 Claims**

1. In a process for sulfur removal from hydrogen sulfide-containing gases wherein said gases may comprise a plurality of streams at least the major portion of which contains a high proportion of carbon dioxide together with carbonyl sulfide or organic sulfur compounds or both, in which process the sulfur containing constituents of said gases are converted to elemental sulfur in a Claus plant, the steps comprising:

(a) passing a gas stream from step (h), optionally in combination with fresh feed gas which contains hydrogen sulfide and is low in carbon dioxide, carbonyl sulfide and organic sulfur compounds, to a Clause plant wherein the predominant part of the hydrogen sulfide contained in the gas entering said Claus plant is converted to elemental sulfur, which is recovered;

(b) recovering, from said Claus plant, off-gas which contains residual hydrogen sulfide;

(c) combining said off-gas with a hydrogen sulfide-containing gas which has a high content of carbon dioxide together with carbonyl sulfide and/or other organic sulfur compounds;

(d) passing the combined gas streams from step (c) at a temperature in the range from 180° C. to 450° C. in the presence of a free hydrogen- and/or free carbon monoxide-containing gas over a sulfide Group VI and/or Group VIII metal catalyst supported on an organic oxidic carrier for the conversion of sulfur compounds other than hydrogen sulfide to hydrogen sulfide;

(e) cooling the reduced gas mixture obtained in step (d) and passing it in a absorption zone, at a temperature below the dew point of water, through a liquid, regenerable absorbent for hydrogen sulfide at a gas velocity of 1 m/sec. or more with respect to the aerated part of the said absorption zone;

(f) discharging the unabsorbed portion of the gas mixture from the process after passage through the said absorbent;

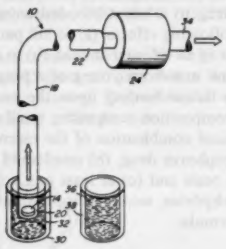
(g) regenerating the hydrogen sulfide enriched absorbent, thereby producing a hydrogen sulfide-rich gas mixture and regenerated absorbent;

(h) returning regenerated absorbent obtained in step (g) to step (e) for further hydrogen sulfide absorption and passing the hydrogen sulfide-rich gas mixture obtained in step (g) to the Claus plant for conversion of the hydrogen sulfide to elemental sulfur.

4,153,675
IMMUNOFLUOROMETRIC METHOD AND APPARATUS FOR MEASURING MINUTE QUANTITIES OF ANTIGENS, ANTIBODIES AND OTHER SUBSTANCES

Marcos Kleinerman, S. Point Rd., Webster, Mass. 01550

Continuation-in-part of Ser. No. 623,567, Oct. 20, 1975, Pat. No. 4,036,946. This application Jul. 14, 1977, Ser. No. 815,555
The portion of the term of this patent subsequent to Jul. 19, 1974, has been disclaimed.
Int. Cl.[2] **G01N** *21/52, 33/16*
U.S. Cl. 424—8 **24 Claims**



15. An apparatus for the fluorometric measurment of minute quantities of a substance in a fluid, said apparatus comprising:

(a) a base stratum of small surface area having the ability to bind and immobilize the substance to be measured, said base stratum attached to a solid support;

(b) means for concentrating the substance to be measured on said base stratum by making said substance to be measured flow into contact with said base stratum, the substance to be measured being bound to said base stratum as it flows into contact therewith;

(c) means for attaching a specific labelled reagent to said substance to be measured bound to said base stratum, the amount of said attached labelled reagent being determined by the amount of the substance to be measured bound to said base stratum, said labelled reagent having a fluorescent label;

(d) an excitation light source for exciting the fluorescence of said labelled reagent; and

(e) means for collecting, detecting and measuring the fluorescence so generated, the intensity of said fluorescence being dependent on the amount of said substance to be measured bound to said base stratum.

4,153,676
METHOD FOR TESTING OF EMBRYOTOXICITY ON CHICKEN EMBRYO

Richard Jelínek; Zdeněk Rychter, and Miroslav Peterka, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Mar. 16, 1977, Ser. No. 778,043
Claims priority, application Czechoslovakia, Apr. 2, 1976, 2170-76
Int. Cl.[2] **A61K** *29/00;* **G01N** *33/00, 33/08*
U.S. Cl. 424—9 **6 Claims**

1. A method for testing a substance for embryotoxicity comprising the steps of:

(A) administering a solution of said substance to a plurality of two-day chicken embryos in graduated dosage levels;

(B) measuring the quantitative response of the caudal morphogenetic system of said embryos to said substance by measuring the length of the newly-formed part of the trunks of the embryos after a 24 hour incubation period, verifying this value by

(C) administering said substance in a single application to said further plurality of embryos in the second, third and fourth day of embryonal development and counting the number of dead and malformed embryos in the eighth day of incubation, plotting dependence between the dose and effect under the above given conditions of application, to form a curve, and

(D) plotting the level of nonspecific effect on the embryo after application of the same volume of solvent for the tested substance as was the volume of the solution of the tested substance in this solvent, whereby the lowest embryotoxically effective dose of said substance is represented by the intersection of said curve with said level.

4,153,677
CONTROLLED-RELEASE COMPOSITION

Philip M. John, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed May 18, 1978, Ser. No. 907,036
Int. Cl.[2] **A61K** *9/48, 9/50, 9/52*
U.S. Cl. 424—19 **12 Claims**

1. A controlled-release pharmaceutical dosage component for hard gelatin capsule unit dosage forms comprising a microcapsule prepared by organic phase separation with polyethylene as a phase separation inducing agent consisting of a film of hydrophobic ethylcellulose polymeric material encapsulating a core substantially in the form of an extruded spherule of approximately 420 to 1190 micron diameter and comprising from about 3 to 80 percent by weight of a bronchodilator agent of the β-adrenergic agonist type (in admixture with a pharmaceutically acceptable excipient), at least 10 percent by weight of microcrystalline cellulose and any remainder being conventional pharmaceutical excipients.

4,153,678
LEVAMISOLE EFFERVESCENT TABLETS

James M. Quinlan, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 17, 1978, Ser. No. 925,658
Int. Cl.[2] **A61K** *31/425, 47/00*
U.S. Cl. 424—44 **5 Claims**

1. An anthelmintically effective, compressed and shaped unit dosage of a solid effervescent composition comprising a pharmaceutically acceptable water soluble salt of levamisole, an alkali metal bicarbonate, a pharmaceutically acceptable adipic or fumaric acid, a non-toxic binder and a non-toxic solid tabletting lubricant, and said composition may, additionally, also contain a pharmaceutically acceptable dye; and said unit dosage form characterized by rapidly releasing all of the above-said drug on dissolution in water with the simultaneous evolution of carbon dioxide and the formation of a clear solution of said drug.

4,153,679
ACYCLIC CARBOXAMIDES HAVING A PHYSIOLOGICAL COOLING EFFECT

David G. Rowsell, Staines; David J. Spring, Datchet, and Roger Hems, Maidenhead, all of England, assignors to Wilkinson Sword Limited, London, United Kingdom

Division of Ser. No. 351,357, Apr. 16, 1973, abandoned. This application Feb. 14, 1977, Ser. No. 768,219
Claims priority, application United Kingdom, Apr. 18, 1972, 17914/72
Int. Cl.[2] **A61L** *9/04;* **A61K** *7/16*
U.S. Cl. 424—45 **12 Claims**

1. In a manufactured consumer product for application to or consumption by the human body, said product comprising a vehicle topically administrable to or consumable by the human body and containing as an adjuvant in said vehicle, a compound capable of stimulating the cold receptors of the nervous system in the surface tissues of the body when brought into contact therewith by topical application or consumption of the said vehicle, said product being:

(i) A toiletry comprising a topically administrable vehicle containing as adjuvants therein a) said cold receptor stim-

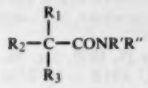
ulating compound and b) at least one of the following: an odourant, antiseptic, colourant or surfactant;

(ii) a foodstuff or beverage comprising an orally ingestible vehicle containing as adjuvants therein

(a) said cold receptor stimulating compound and b) a flavourant; or

(iii) a tobacco or tobacco-containing manufacture containing said cold receptor stimulating compound;

the improvement which comprises using as said cold receptor stimulating compound an effective amount of a cold receptor stimulating acyclic carboxamide of the formula:



wherein

R′ and R″ are each methyl or ethyl;

R_1 is methyl, ethyl or n-propyl;

R_2 and R_3 are each C_1–C_5 alkyl, with the proviso that at least one of R_2 and R_3 is branched at the carbon atom in the alpha or beta position;

R_1, R_2 and R_3 together providing a total of at least 5 carbon atoms.

4,153,680

HYDROUS SILICA GEL CONTAINING DENTIFRICE

Earl K. Seybert, Towson, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 655,601, Feb. 5, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,758

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 **9 Claims**

1. An oral dentifrice composition providing good polishing of teeth, having as one component a cleansing and polishing agent consisting of a hydrous silica gel containing 17 to 32 percent by weight water, with an average particle size in the range of 2 to 30 microns, said hydrous silica gel comprising from about 5 percent to 50 percent by weight of the oral dentifrice composition and said oral dentifrice composition having a radioactive dentine abrasion value of from 400 to 705.

4,153,681

COMPOSITION FOR PERMANENT WAVING

Kikuo Shiba, Tokyo, Japan, assignor to Yamanouchi Pharmaceutical Co., Ltd. and Nippon Rikagakuyakuhin Company, Ltd., both of Tokyo, Japan

Filed Aug. 8, 1977, Ser. No. 822,717

Claims priority, application Japan, Aug. 19, 1976, 51-98897

Int. Cl.[2] A61K *7/09*

U.S. Cl. 424—72 **6 Claims**

1. A composition for permanent waving of hair consisting essentially of an aqueous solution of a lower alkyl ester of cysteine or a mineral acid salt thereof and having a pH of 6.0–10.0, wherein the proportion of the lower alkyl ester of cysteine or the mineral acid salt thereof in the aqueous solution is 3–10% by weight, and at least one additive selected from the group consisting of an effective amount of a penetrant, a stabilizing agent, a wetting agent, a viscosity-increasing agent, a perfume, a coloring agent, an emulsifier, and an antihistamine, said stabilizing agent being an ethylenediaminetetraacetate.

4,153,682

COMPOSITIONS FOR CONTROLLED AVAILABILITY OF MEDICALLY USEFUL ORGANOPHOSPHORUS COMPOUNDS

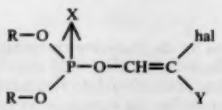
Stanley Ackers, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 713,158, Aug. 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 607,397, Aug. 25, 1975, abandoned. This application Nov. 17, 1977, Ser. No. 852,371

Int. Cl.[2] A61K *31/74;* **A01N** *17/00*

U.S. Cl. 424—78 **9 Claims**

1. A composition adapted to administration of an organophosphorus drug to a warm-blooded animal to attain one or more of the following effects: (a) to kill parasites in the gastrointestinal tract of an infested animal; (b) to increase the vitality of the fetus and new-born young of a pregnant mammal; and (c) to kill fly larvae feeding upon the excreted feces of the animal, said composition comprising small solid particles of an intimate physical combination of the essential ingredients: (a) an organophosphorus drug, (b) small solid porous particles of a polyvinylic resin and (c) at least one copolymer of styrene and maleic anhydride, said organophosphorus drug being one having the formula:



wherein each R is alkyl of from 1 to 10 carbon atoms, X is oxygen or sulfur, Y is hydrogen or middle halogen and "hal" is middle halogen, said polyvinylic resin particles having a pore volume of from about 0.15 to about 0.70 cubic centimeters per gram and being from about 30- to about 100-mesh in size, and said styrene/maleic anhydride copolymer having a weight average molecular weight of from about 2,000 to about 200,000, a styrene-to-maleic anhydride residue ratio of from about 1:1 to about 4:1 and optionally having a material part of the maleic anhydride residues converted to maleic acid residues, the amount of said copolymer being from about 25 to about 120% of the pore volume of said polyvinylic resin, and the weight ratio of said drug to said copolymer being from about 0.5 to about 0.8, the amount of said drug being sufficient to attain the intended effect.

4,153,683

GALENIC IMMUNE-GLOBULIN PREPARATION

Wolfgang Stephan, Dreieich, Fed. Rep. of Germany, assignor to Biotest-Serum-Institut GmbH, Frankfurt, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,672

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1976, 2610854

Int. Cl.[2] A61K *39/00, 39/40, 39/42*

U.S. Cl. 424—85 **9 Claims**

1. A galenic immune-globulin ointment for the treatment of skin fungus diseases, comprising about 1 to 30% by weight of immune-globulin prepared from human blood, and an ointment carrier.

4,153,684

IMMUNIZING AND ANTI-INFECTIOUS ADJUVANT AGENTS CONSTITUTED BY N-ACETYL-MURAMYL-L-ALANYL-D-GLUTAMIC ACID DERIVATIVES

Francoise Audibert, Neuilly-sur-Seine; Louis Chedid, Paris; Pierre Lefrancier, Bures-sur-Yvette; Jean Choay, Paris, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

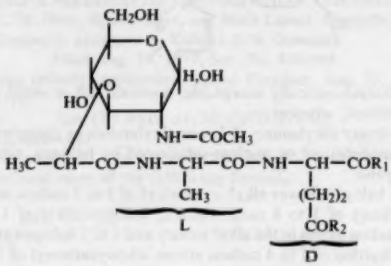
Continuation-in-part of Ser. No. 516,991, Oct. 22, 1976. This application Mar. 7, 1977, Ser. No. 775,215

Claims priority, application France, Mar. 10, 1976, 76 06819; Mar. 10, 1976, 76 06820; Mar. 10, 1976, 76 06821; United Kingdom, Nov. 2, 1976, 45597/76; France, Jan. 31, 1977, 77 02646

Int. Cl.[2] A61K *37/02;* C07C *103/52*

U.S. Cl. 424—88 41 Claims

1. Esters of 2-(2-acetamido-2-deoxy-3-O-D-glucopyranosyl)-D-propionyl-L-alanyl-D-glutamic acid and of 2-(2-acetamido-2-deoxy-3-O-D-glucopyranosyl)-D-propionyl-L-alanyl-D-isoglutamine corresponding to the formula



in which R_1 is $-OC_nH_{2n+1}$, with n=1, 2 or 3, or $-NH_2$, R_2 is $-OC_pH_{2p+1}$, with p=0, 1, 2 or 3, p being not equal to 0 when R_1 is $-NH_2$.

4,153,685

BISMUTH COMPLEX PREPARATIONS

Willem J. Serfontein, Warmbad, South Africa, assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 887,363, Dec. 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 788,745, Jan. 3, 1969, abandoned. This application May 21, 1973, Ser. No. 362,282

Claims priority, application South Africa, Nov. 23, 1968, 68/8411; Dec. 23, 1968, 68/8414

Int. Cl.[2] A61K *37/48, 37/00, 31/29*

U.S. Cl. 424—94 25 Claims

1. A pharmaceutical preparation comprising a therapeutically effective amount of at least one essentially non-dialysable physiologically acceptable complex between:

(a) bismuth in its trivalent state of oxidation and

(b) a physiologically acceptable, water-soluble proteinaceous molecule having an affinity for said bismuth,

(c) ammonia

(d) a complex-forming organic acid,

said complex being essentially water-soluble to the extent that it forms a sufficient concentration in the water-dissolved state to exhibit anti-ulcer activity in the gastro-intestinal tract, being essentially reversibly precipitable by alcohol and in which the bismuth remains essentially complexed with the proteinaceous matter under the conditions of dialysis, the complex itself being non-dialysable.

4,153,686

PROCESS FOR THE PREPARATION OF GLUCOPROTEINS AS WELL AS THE USE THEREOF

Hans-Hugo Nagel, Haynstrasse 19, 2000 Hamburg 20, Fed. Rep. of Germany

Filed Jan. 18, 1977, Ser. No. 760,423

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1976, 2603122

Int. Cl.[2] A61K *37/02*

U.S. Cl. 424—176 7 Claims

1. Use of stabilised glucoprotein for the preparation of medicaments with a potentiating action on the active substances, whereby 10^2 to 10^6 parts by weight of the active medicament substance is used per 1 part by weight of glucoprotein[.], wherein said stabilized glucoprotein is prepared by reacting an aqueous suspension of yeast with monosaccharides and native albumin as starting substance, and separating the glucoprotein from the resulting reaction medium, and thereafter adding an inorganic electrolyte and/or a saccharide and albumin mixture thereto to stabilize the same.

4,153,687

DERIVATIVES, HAVING AN INHIBITORY ACTION AGAINST PROTEASE AND AN ANTIPHLOGISTIC ACTION, OF THE TRYPSIN-KALLIKREIN INHIBITOR OBTAINED FROM CATTLE ORGANS (BPTI), THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Eugen Schnabel; Gerd Reinhardt; Horst D. Schlumberger, all of Wuppertal; Ernst Truscheit, Doernberg, and Harold Tschesche, Bielfeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 2, 1977, Ser. No. 847,886

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1976, 2654124

Int. Cl.[2] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 17 Claims

1. A derivative of kallikrein-trypsin inhibitor (BPTI) in which the 10—and/or 21—trypsin residue is linked, in the ortho-position relative to the phenolic hydroxyl group, to a mononuclear or polynuclear aromatic carbocyclic or heterocyclic radical, which in turn can be unsubstituted or substituted by alkyl, alkoxy, sulfonic acid, sulfonyl, carboxyl, nitro, cyano, trifluoromethyl, chloro groups or atoms via an azo group.

4,153,688

TRIFLUOROMETHYLATED OLIGOPEPTIDES

Jean-Luc Dimicoli, Orsay; Camille G. Wermuth, and Joseph G. Bieth, both of Strasbourg, all of France, assignors to Delalande S.A., Courbevoie, France

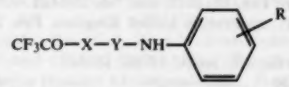
Filed Feb. 9, 1978, Ser. No. 876,500

Claims priority, application France, Feb. 18, 1977, 77 04713

Int. Cl.[2] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 12 Claims

1. Compounds of formula:



(I)

in which the couple —X—Y— represents:

either the sequence -L-Ala-L-Ala, in which case R designates:

a hydrogen atom;

a nitro or trifluoromethyl group in the meta position; or

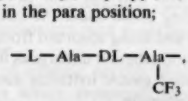
a chlorine atom or a nitro, trifluoromethyl, methoxy, isopropyl, cyano or carboxyl group in the para position;

or the sequence -L-Lys-L-Ala-, in which case R designates:

a hydrogen atom; or

a trifluoromethyl, methyl, isopropyl, N,N-dimethylamino or acetyl group in the para position;

or the sequence



in which case R designates a hydrogen atom;

or the sequence -L-Lys-L-Lys or -L-Ala-L-Lys-, in which case R represents a trifluoromethyl group in the para position.

4,153,689

STABLE INSULIN PREPARATION FOR NASAL ADMINISTRATION

Shin-Ichiro Hirai, Kawanishi; Toshiaki Ikenaga, Takatsuki, and Tai Matsuzawa, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 686,220, May 12, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,955

Claims priority, application United Kingdom, Jun. 13, 1975, 25351/75

Int. Cl.[2] A61K *37/26*

U.S. Cl. 424—178 **45 Claims**

1. A stable aqueous insulin solution having a pH value in the range of from 2.5 to 4.7, which comprises 0.1 to 10 weight percent of insulin and as a stabilizing agent 0.1 to 20 weight percent of a member selected from the group consisting of (a) at least one non-ionic surface-active agent whose hydrophile/-lipophile balance value is in the range of from 9 to 22, (b) polyethylene glycol having a molecular weight in the range of from 200 to 7500 and (c) mixtures of (a) and (b).

4,153,690

MEDICAMENT DERIVED FROM SOUTHERN WAX MYRTLE (*MYRICA CERIFERA*) FOR ARTHRITIC CONDITIONS

Harvey L. Burnett, 404 Shirley St., DeRidder, La. 70634

Filed Dec. 29, 1976, Ser. No. 755,147

Int. Cl.[2] A61K *35/78*

U.S. Cl. 424—195 **12 Claims**

1. A process of preparing a medicament for alleviating arthritic pain which comprises

a. removing the protective bark from the root of Southern Wax Myrtle (Myrica Cerifera);

b. subjecting the resulting exposed sap-containing portion of said root to extraction with water at an elevated temperature so that the water leaches and dissolves components from the exposed sapcontaining portion of said root as evidenced by a darkening of the coloration of the resulting aqueous extraction solution; and

c. terminating the extraction when said solution possesses a brown coloration.

4,153,691

ANALGESIC AND ANTI-INFLAMMATORY COMPOSITIONS

Adrian F. Davis, Feltham, and Gordon J. A. Dixon, Surbiton, both of England, assignors to Beecham Group Limited, United Kingdom

Filed Feb. 17, 1977, Ser. No. 769,428

Claims priority, application United Kingdom, Feb. 20, 1976, 6716/76

Int. Cl.[2] A61U *31/60, 31/625*

U.S. Cl. 424—230 **6 Claims**

1. An orally administrable pharmaceutical composition having analgesic, antipyretic and anti-inflammatory activity upon administration to humans in need thereof in the form of a capsule, pill, tablet, aqueous suspension containing a coloring, flavoring or wetting agent or a powder for addition to and forming such an aqueous suspension, said composition comprising an amount of 2-(carbamoyl)-phenyl-2-acetoxybenzoate effective to produce such activity and one or more pharmaceutically acceptable oral carriers, said (2-carbamoylphenyl)2-acetoxybenzoate being stable under the acid pH conditions of the human stomach and being absorbed from the gastro-intestinal tract into the blood where it undergoes hydrolysis to active form and thus avoiding gastric irritation due to aspirin and the inactivation of salicylamide.

4,153,692

ACYLATED IMIDAZOLYL-O,N-ACETALS, THEIR PHARMACEUTICALLY ACCEPTABLE SALTS AND METAL COMPLEXES

Wolfgang Krämer; Karl H. Büchel, and Manfred Plempel, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

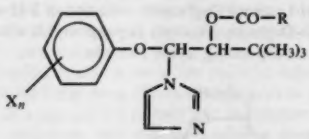
Division of Ser. No. 764,830, Feb. 2, 1977. This application Jan. 27, 1978, Ser. No. 872,901

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604865

Int. Cl.[2] A61K *31/415, 31/555*

U.S. Cl. 424—245 **36 Claims**

17. A method for treating mycoses in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a compound of the formula



or a pharmaceutically acceptable, nontoxic salt or metal complex thereof, wherein

R is lower alkylamino; di-lower alkylamino; or phenylamino unsubstituted or nuclear-substituted by halogen, nitro or cyano;

X is halogen; lower alkyl; cycloalkyl of 5 to 7 carbon atoms; alkoxy of 1 to 4 carbon atoms; halogenoalkyl of 1 to 4 carbon atoms in the alkyl moiety and 1 to 5 halogen atoms; alkylthio of 1 to 4 carbon atoms; alkoxycarbonyl of 1 to 4 carbon atoms in the alkoxy moiety; phenyl unsubstituted or substituted by halo, amino, cyano, nitro or alkyl of 1 to 4 carbon atoms; phenoxy unsubstituted or nuclear-substituted by halo, amino, cyano, nitro or alkyl of 1 to 4 carbon atoms; amino, cyano, or nitro; and

n is 0 or an integer from 1 to 5; in combination with a pharmaceutically acceptable, non-toxic carrier suitable for administration to humans and animals.

4,153,693

1,4-DIHYDRO-4-OXO-PYRIDYLACETAMIDO CEPHALOSPORINS AND THEIR UTILIZATION AS MEDICINAL AGENTS FOR COMBATING BACTERIAL INFECTIONS

Rolf Gericke; Werner Rogalski; Rolf Bergmann, all of Darmstadt; Walter Hameister, Berlin, and Helmut Wahlig, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

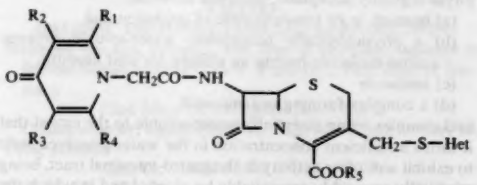
Filed Sep. 6, 1974, Ser. No. 503,705

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1973, 2345402; Jun. 6, 1974, 2427224

Int. Cl.[2] A61K *31/545;* C07D *501/56, 501/46*

U.S. Cl. 424—246 **14 Claims**

1. A compound of the formula



wherein R_1, R_2, R_3 and R_4 each are selected from the group consisting of hydrogen, alkyl of 1–4 carbon atoms, alkoxy of

1-4 carbon atoms, OH, F, Cl, Br, I, $NO_2$and NH_2; Het is 3-methyl-1,2,4-thiadiazolyl-5, 5-methyl-1,3,4-oxadiazolyl-2, 5-hydroxymethyl-1,3,4-oxadiazolyl-2, 5-methyl-1,3,4-thiadiazolyl-2, 5-hydroxymethyl-1,3,4-thiadiazolyl-2, tetrazolyl-5, 1-methyltetrazolyl-5, 1,2,3-triazolyl-4, 4-methyloxazolyl-2 and 1-oxidopyridinio-2; and R_5 is selected from the group consisting of hydrogen, tert.-butyl, trimethylsilyl, benzyl, benzhydryl, trichloroethyl, benzoylmethyl, p-methoxybenzyl, methoxymethyl and pivaloyloxymethyl; and the physiologically acceptable salts thereof.

12. A pharmaceutical composition comprising an anti-bacterially effective amount per unit dosage of a compound of claim 1, in admixture with a pharmaceutically acceptable carrier.

13. A method of treating bacterial infections in mammals which comprises administering to an infected mammal an anti-bacterially effective amount of a compound of claim 1.

4,153,694
BEHENIC ACID ESTERS, COMPOSITIONS THEREOF AND A METHOD OF PREPARATION THEREOF

Jørn L. M. Buus, Bjaeverskov, and Niels Lassen, Gentofte, both of Denmark, assignors to Kefalas A/S, Denmark

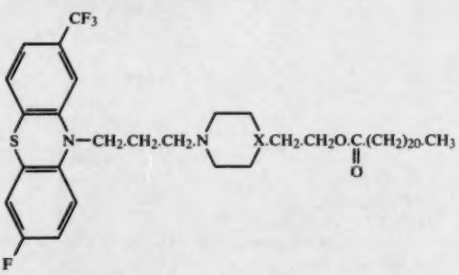
Filed Aug. 19, 1977, Ser. No. 826,049

Claims priority, application United Kingdom, Aug. 25, 1976, 35411/76

Int. Cl.[2] **A61K** *31/38;* **C07D** *279/28*

U.S. Cl. 424—247 **10 Claims**

1. A compound selected from the group consisting of 1) a behenic acid ester of the following formula:



I

wherein X is selected from "N" and "CH," and 2) an acid addition salt thereof with a pharmaceutically acceptable acid.

5. A pharmaceutical composition comprising a major quantity of a pharmaceutical carrier and a pharmaceutically effective dose of a compound as defined in claim 1.

4,153,695
SUBSTITUTED 2,3-DIHYDRO IMIDAZO[1,2-c]PYRIMIDINES

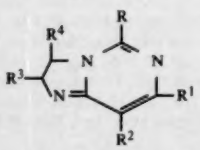
William W. Turner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 9, 1978, Ser. No. 884,884

Int. Cl.[2] **C07D** *487/04;* **A61K** *31/505*

U.S. Cl. 424—251 **14 Claims**

1. A compound of the formula:



wherein R is H, C_1–C_5 alkyl, amino, phenyl or CH_3—S, R^1 is Cl, and R^2, R^3 and R^4 individually are H, methyl or phenyl with the proviso that R is H only when one of R^3 and R^4 is methyl, and pharmaceutically-acceptable acid addition salts thereof formed with strong acids.

12. The process of treating Herpes simplex infections on skin or mucosal membranes which comprises applying to said infected surface an anti-Herpes concentration of a compound according to claim 1 in a non-irritating vehicle.

4,153,696
DIHYDROXYPHENYLETHYLAMINOALKYL THEOPHYLLINES

Axel Kleemann, Hanau; Karl H. Klingler, Langen; Ansgar von Schlichtegroll, Bad Homburg; Fritz Stroman, Offenbach; Klaus Thiemer, Hanau, and Erik Westermann, Hannover-Buchholz, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

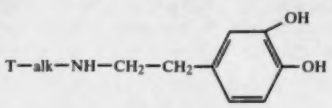
Filed Nov. 29, 1977, Ser. No. 855,620

Claims priority, application United Kingdom, Dec. 14, 1976, 52071/76

Int. Cl.[2] **C07D** *473/08*

U.S. Cl. 424—253 **11 Claims**

1. A compound corresponding to the general formula



in which T is the theophyllin-7-yl radical and alk is an alkylene chain with 3 carbon atoms, or a pharmaceutically acceptable salt thereof.

4,153,697
8-AMINO-2-METHYL-4-PHENYL-1,2,3,4-TETRAHYDROISOQUINOLINE-8-N-GLUCURONIDE PHARMACEUTICAL PREPARATIONS AND METHOD OF USE

Ingolf Hornke, Bremthal; Hans-Wolfram Fehlhaber, Hofheim and Michael Uihlein, Kriftel, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 23, 1978, Ser. No. 908,775

Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2723524

Int. Cl.[2] **A61K** *31/47;* **C07D** *407/12*

U.S. Cl. 424—258 **4 Claims**

1. 8-Amino-2-methyl-4-phenyl-1,2,3,4-tetrahydroisoquinoline-8-N-glucuronide.

2. A pharmaceutical composition for the treatment of psychic disorders comprising an effective amount of a compound as in claim 1 in combination with a pharmaceutically acceptable carrier therefor.

3. The method of treating psychic disorders in a patient suffering therefrom which comprises administering to said patient an effective amount of a compound as in claim 1.

4,153,698

ISOQUINOLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Daniel Farge, Thiais; Alain Jossin, Saint Cloud; Gerard Ponsinet, Sucy-en-Brie, and Daniel Reisdorf, Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

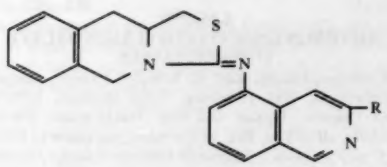
Filed Jan. 20, 1978, Ser. No. 871,136

Claims priority, application France, Jan. 20, 1977, 77 01516; Dec. 23, 1977, 77 39028

Int. Cl.[2] A61K *31/47*; C07D *513/14*

U.S. Cl. 424—258 **8 Claims**

1. An isoquinoline derivative of the formula:



wherein R represents alkyl of 1 through 10 carbon atoms, and non-toxic pharmaceutically acceptable acid addition salts thereof.

8. A pharmaceutical composition useful as an analgesic, anti-pyretic or anti-inflammatory which comprises as active ingredient an effective amount of an isoquinoline derivative as claimed in claim **1**, or a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a significant amount of a pharmaceutical carrier.

4,153,699

THIAZOLO[3,4-A]INDOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Daniel Farge, Thiais; Alain Jossin, Saint Cloud; Gerard Ponsinet, Sucy-en-Brie, and Daniel Reisdorf, Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jan. 20, 1978, Ser. No. 871,133

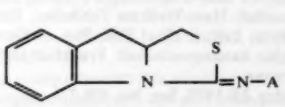
Claims priority, application France, Feb. 4, 1977, 77 03186; Dec. 23, 1977, 77 39029

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/47, 31/44*; C07D *513/14*

U.S. Cl. 424—258 **8 Claims**

1. A thiazolo[3,4-a]indole derivative of the formula:



wherein A represents a heterocyclic radical selected from 3-pyridyl, 4-pyridyl, 5-isoquinolyl and 5-isoquinolyl substituted in the 3-position by alkyl of 1 through 10 carbon atoms, and non-toxic pharmaceutically acceptable acid addition salts thereof.

8. A pharmaceutical composition useful as an antipyretic, anti-inflammatory and analgesic agent, which comprises as active ingredient an effective amount of a thiazolo[3,4-a]-indole derivative as claimed in claim **1**, or a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a significant amount of a pharmaceutically acceptable carrier.

4,153,700

TREATMENT OF THE ACUTE AFTER-EFFECTS RESULTING FROM ALCOHOL INGESTION

Carl S. Rosenberg, Chicago, Ill., assignor to Lake Shore Roentgenology Ltd., Chicago, Ill.

Continuation-in-part of Ser. No. 608,103, Aug. 27, 1975, which is a continuation-in-part of Ser. No. 111,077, Jan. 29, 1971, abandoned. This application Jun. 10, 1977, Ser. No. 805,595

Int. Cl.[2] A61K *31/48*

U.S. Cl. 424—261 **2 Claims**

1. A composition for use in the treatment of the acute after effects resulting from alcohol ingestion consisting essentially of ergotamine tartrate and cyproheptadine, the ergotamine tartrate being present in a weight ratio within the range 1 to 12 parts by weight per part by weight of cyproheptadine.

4,153,701

2-SUBSTITUTED-N-(3-SUBSTITUTED PHENYL)-OXAZOLIDINE-3-CARBOTHIOAMIDES

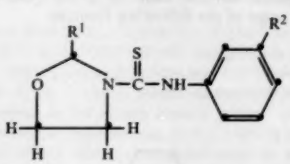
Terry W. Balko, Waldron, and Ronald E. Hackler, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 27, 1977, Ser. No. 865,092

Int. Cl.[2] A61K *31/42, 31/44*; C07D *213/90*

U.S. Cl. 424—263 **33 Claims**

1. A compound of the formula,



wherein

R^1 represents

(A) C_1–C_6 alkyl;

(B) C_3–C_6 cycloalkyl;

(C) phenyl, optionally monosubstituted with halo; or

(D) 3-pyridyl; and

R^2 represents

(A) halo,

(B) trifluoromethyl,

(C) cyano, or

(D) 1,1,2,2-tetrafluoroethoxy.

12. A method for reducing or eradicating a population of the insect species *Epilachna varivestis* which comprises administering to the insect by ingestion an insecticidally-effective amount of a compound of claim **1**.

23. An insecticidal composition which comprises an insecticidally-effective amount of a compound of claim **1** and an agriculturally-acceptable carrier.

4,153,702

BASICALLY ALKYLATED DITHIOSALICYCLIC ACID AMIDES AND THEIR USE AS MEDICAMENTS

Ulrich Hörlein, Wuppertal; Horst Böshagen, Haan, and Friedel Seuter, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

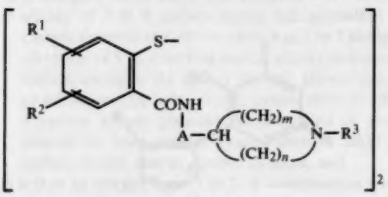
Filed Nov. 21, 1977, Ser. No. 853,710

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656227

Int. Cl.[2] C07D *295/12*; A61K *31/445*

U.S. Cl. 424—267 **10 Claims**

1. A diphenyl disulphide-2,2'-bis-carboxylic acid amide of the general formula (I)



(I)

in which

R^1 represents hydrogen, halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, phenalkoxy or naphthalkoxy, the alkoxy group containing 1 to 4 carbon atoms,

R^2 represents hydrogen, halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms or, together with the substituent R^1, forms an alkylene or alkenylene chain with 2 to 5 carbon atoms,

R^3 represents alkyl with 1 to 4 carbon atoms,

A represents a single bond or an alkylene chain with 1 to 3 carbon atoms and

m and n each represent 0 or an integer of from 1 to 5,

m and n together having a value of from 2 to 5, or an acid addition salt thereof.

8. A method of combating thromboembolic illness in warm-blooded animals which comprises administering to the said animals, thromboembolic effective amount of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,153,703

METHOD OF CONTROLLING INSECTS AND ACARIDS WITH CERTAIN ARYL-SUBSTITUTED THIAZOLES

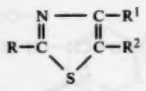
William A. Harrison, Guelph, Canada; Winchester L. Hubbard, Woodbridge; Robert E. Grahme, Jr., Cheshire, both of Conn., and James N. Tousignant, Guelph, Canada, assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Ontario, Canada

Filed Jun. 30, 1977, Ser. No. 811,648

Int. Cl.[2] A01N *9/12, 9/22*

U.S. Cl. 424—270 **5 Claims**

1. A method of controlling insect or acarid pests which comprises contacting the locus of said pests with an insecticidally or acaricidally effective amount of an aryl-substituted thiazole having the following structural formula:



wherein R is selected from the group consisting of phenyl, alkylphenyl having 7 to 14 carbon atoms, aminophenyl, alkaminophenyl having 7 to 14 carbon atoms, halophenyl, and hydroxyphenyl; R^1 is selected from the group consisting of hydrogen, alkyl having 1 to 5 carbon atoms, phenyl, biphenylyl, aminophenyl, alkaminophenyl having 7 to 14 carbon atoms, alkylphenyl having 7 to 14 carbon atoms, and halophenyl; and R^2 is selected from the group consisting of hydrogen, alkyl having 1 to 5 carbon atoms, phenyl, halophenyl, and nitro; provided that two of R, R^1 and R^2 are aromatic.

4,153,704

ETHYLENE DERIVATIVES

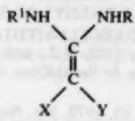
Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote; Charon R. Ganellin, Welwyn Garden City, and Hunter D. Prain, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 797,160, May 16, 1977, Pat. No. 4,124,717, which is a division of Ser. No. 629,174, Nov. 5, 1975, Pat. No. 4,046,907, which is a continuation-in-part of Ser. No. 468,617, May 9, 1974, Pat. No. 3,953,460. This application Nov. 22, 1977, Ser. No. 853,911

Int. Cl.[2] A61K *31/425;* **C07D** *275/02, 277/20, 277/24*

U.S. Cl. 424—270 **6 Claims**

1. A compound of the formula:



wherein X and Y, which may be the same or different, are hydrogen, nitro, cyano or SO_2Ar but are not both hydrogen; R^1 is Im—$(CH_2)_mZ(CH_2)_n$ wherein Im is imidazole which is attached at a ring carbon and which is unsubstituted or substituted by lower alkyl or halogen; R is Het—$(CH_2)_mZ(CH_2)_n$; Z is sulphur or methylene; m is 0, 1 or 2 and n is 2 or 3 provided that the sum of m and n is 3 or 4; Het is a nitrogen containing 5 membered heterocyclic ring selected from oxazole, isoxazole, triazole, thiazole, isothiazole or thiadiazole which ring is attached at a ring carbon and is unsubstituted or substituted by lower alkyl, hydroxyl halogen or amino; and Ar is phenyl unsubstituted or substituted by halogen or methyl or a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition to inhibit H-2 histamine receptors, suitable for oral or parenteral administration, comprising a pharmaceutical carrier and in an amount effective to inhibit said receptors a compound of claim **1**.

4,153,705

THIAZOLYL CINNAMIC ACID NITRILES, PESTICIDES CONTAINING THE SAME

Reinhold Puttner, and Hartmut Joppien, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

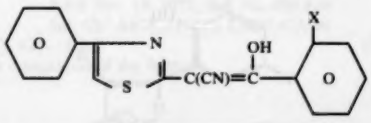
Filed Jan. 12, 1978, Ser. No. 869,001

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703542

Int. Cl.[2] C07D *277/02*

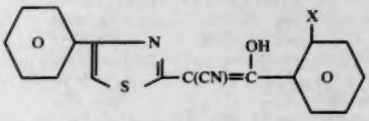
U.S. Cl. 424—270 **13 Claims**

1. Thiazolyl cinnamic acid nitrile of the formula



wherein X is a residue selected from the group consisting of alkyl of up to four carbons, alkoxy of up to three carbons, trifluoromethyl, nitro, and halogen selected from the group consisting of chloro, bromo, fluoro and iodo.

2. A pesticide composition with insecticidal activity comprising about 10 to 80% by weight of thiazolyl cinnamic acid nitrile of the formula



wherein X is selected from the group consisting of alkyl of up to four carbons, alkoxy of up to three carbons, trifluoromethyl, nitro, and halogen selected from the group consisting of chloro, bromo, fluoro and iodo, and about 90 to 20% by weight of liquid or solid carrier material.

4,153,706

6-HYDROXY-5,6-PHENYL-2,3,5,6-TETRAHYDROIMIDAZO[2,1-b]THIAZOLES

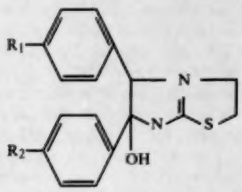
Paul E. Bender, Cherry Hill, N.J., and David T. Hill, North Wales, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 13, 1978, Ser. No. 876,952

Int. Cl.[2] C07D *277/60*

U.S. Cl. 424—270 **8 Claims**

1. A compound of the formula:



in which R_1 is lower alkoxy, lower alkylthio, fluoro, chloro, bromo or trifluoromethyl; and R_2 is fluoro, chloro, bromo or trifluoromethyl.

8. A method of producing antiarthritic activity which comprises administering internally to an animal a compound of claim **1**.

4,153,707

FUNGICIDAL ISOXAZOLYL PHENOLS AND METHOD OF USE

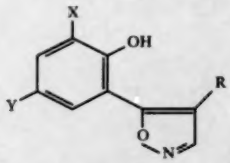
Malcolm W. Moon, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 713,922, Aug. 12, 1976, Pat. No. 4,065,574, which is a continuation-in-part of Ser. No. 608,850, Aug. 29, 1975, abandoned, which is a continuation of Ser. No. 457,056, Apr. 1, 1974, abandoned. This application Nov. 10, 1977, Ser. No. 850,213

Int. Cl.[2] A61K *31/42*; C07D *261/08*

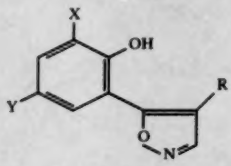
U.S. Cl. 424—272 **30 Claims**

1. A compound of the formula:



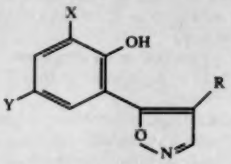
wherein X is a member selected from the group consisting of hydrogen, alkyl of from 1 to 3 carbon atoms, inclusive, chlorine or bromine; Y is a member selected from the group consisting of hydrogen, chlorine or bromine and R is a member selected from the group consisting of hydrogen or lower alkyl of from 1 to 3 carbon atoms, inclusive.

11. A method for controlling fungi comprising the application of an effective antifungal amount of a compound of the formula:



wherein X is a member selected from the group consisting of hydrogen, alkyl of from 1 to 3 carbon atoms, inclusive, chlorine or bromine; Y is a member selected from the group consisting of hydrogen, chlorine or bromine and R is a member selected from the group consisting of hydrogen or lower alkyl of from 1 to 3 carbon atoms, inclusive, to fungi, objects or a situs.

21. A composition comprising a fungicidal amount of a compound of the formula:



wherein X is a member selected from the group consisting of hydrogen, alkyl of from 1 to 3 carbon atoms, inclusive, chlorine or bromine; Y is a member selected from the group consisting of hydrogen, chlorine or bromine and R is a member selected from the group consisting of hydrogen or lower alkyl of from 1 to 3 carbon atoms, inclusive, in association with an inert carrier.

4,153,708

ACYLATED IMIDAZOLYL-O,N-ACETALS, THEIR PHARMACEUTICALLY ACCEPTABLE SALTS AND METAL COMPLEXES

Wolfgang Kramer; Karl H. Buchel, and Manfred Plempel, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

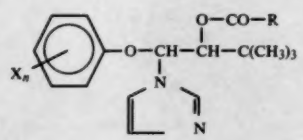
Filed Feb. 2, 1977, Ser. No. 764,830

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604865

Int. Cl.[2] A61K *1/415, 1/555*

U.S. Cl. 424—273 R **66 Claims**

32. A method for treating mycoses in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a compound of the formula



or a pharmaceutically acceptable, nontoxic salt or metal complex thereof, wherein

R is alkyl of 1 to 18 carbon atoms; alkenyl of 2 to 4 carbon atoms; alkinyl of 2 to 4 carbon atoms; cycloalkyl of 5 to 7 carbon atoms; halogenalkyl of 1 to 4 carbon atoms in the alkyl moiety and 1 to 5 halogen atoms; or phenoxyalkyl unsubstituted or nuclear-substituted by halogen, amino, cyano, nitro or alkyl of 1 to 4 carbon atoms;

X is halogen; lower alkyl; cycloalkyl of 5 to 7 carbon atoms; alkoxy of 1 to 4 carbon atoms; halogenoalkyl of 1 to 4 carbon atoms in the alkyl moiety and 1 to 5 halogen atoms; alkylthio of 1 to 4 carbon atoms; alkoxycarbonyl of 1 to 4 carbon atoms in the alkoxy moiety; phenyl unsubstituted or substituted by halo, amino, cyano, nitro or alkyl of 1 to 4 carbon atoms; phenoxy unsubstituted or nuclear-substituted by halo, amino, cyano, nitro or alkyl of 1 to 4 carbon atoms; amino; cyano; or nitro; and

n is 0 or an integer from 1 to 5; in combination with a pharmaceutically acceptable, non-toxic carrier suitable for administration to humans and animals.

4,153,709

N-HETEROCYCLIC UREAS AS IMMUNE REGULANTS

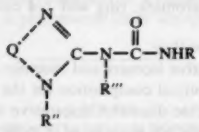
Charles J. Paget, Indianapolis, and John L. Sands, West Lafayette, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 651,322, Jan. 21, 1976, Pat. No. 4,088,760, which is a continuation-in-part of Ser. No. 574,997, May 6, 1975, abandoned, which is a division of Ser. No. 398,607, Sep. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 185,823, Oct. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 794,756, Jan. 28, 1969, abandoned. This application Oct. 20, 1977, Ser. No. 843,775

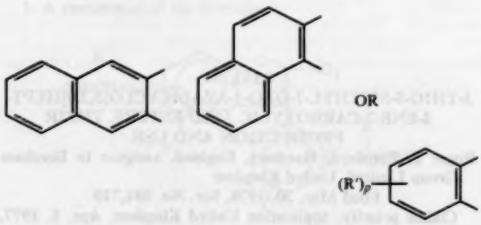
Int. Cl.[2] A61K *31/415;* **C07D** *235/04*

U.S. Cl. 424—273 B **3 Claims**

1. The method for regulating the immune response which comprises administering to a mammal suffering from an immune reaction a dose of from 0.1 to 500 mg/kg of mammalian body weight of a compound of the formula:



wherein R is α-naphthyl, phenyl or substituted phenyl or substituted phenyl wherein said substituents can be one or two members of the group consisting of halo, C_1–C_3 alkoxy, C_1–C_3 alkyl or CF_3, R″ and R‴ are independently H or CH_3 and Q is



wherein R′ in each of its "p" occurrences independently represents halo, CF_3, carb-C_1-C_3-alkoxy, nitro, C_1–C_3 alkyl or C_1–C_3 alkoxy and p is 0-2.

4,153,710

N-(4-[2-(PYRAZOLE-1-CARBONAMIDE)-ETHYL]-BENZENESULPHONYL)-UREA

Zdzisław Brzozowski, Gdańsk; Stanisław Magiełka, Starogard Gdański; Stefan Angielski, Gdańsk; Stanisław Janicki; Czesław Wójcikowski, both of Gdańsk-Oliwa, and Zenon Jakubowski, Gdańsk-Nowy Port, all of Poland, assignors to Starogardzkie, Zaklady Farmaceutyczne POLFA, Starogard Gdański and Akademia Medyczne, Gdańsk, both of, Poland

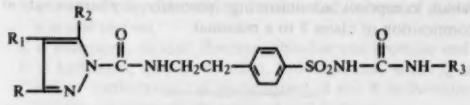
Filed Dec. 20, 1977, Ser. No. 862,755

Claims priority, application Poland, Dec. 31, 1976, 195000

Int. Cl.[2] A61K *31/415;* **C07D** *231/16*

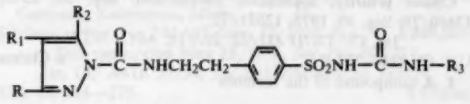
U.S. Cl. 424—273 P **19 Claims**

1. A compound of the formula 1



wherein R and R_2 are each a hydrogen atom or a lower alkyl of up to 4 carbon atoms, R_1 is hydrogen, chlorine or a lower alkyl group containing up to 4 carbon atoms and R_3 is an alkyl of 2 to 5 carbon atoms or cycloalkyl of 5 to 6 carbon atoms.

16. A pharmaceutical composition for the treatment of diabetes containing non-toxic pharmaceutical carriers and an active hypoglycemic compound selected from the group of N-{4-[2-(pyrazole-1-carbonamide)-ethyl]-benzenesulphonyl}-ureas of the formula 1



wherein R and R_2 are each a hydrogen atom or a lower alkyl or up to 4 carbon atoms, R_1 is a hydrogen, chlorine or lower alkyl group containing up to 4 carbon atoms and R_3 is an alkyl of 2 to 5 carbon atoms or cycloalkyl of 5 to 6 carbon atoms, said composition supplying the said compound of formula 1 in an amount sufficient to decrease blood-glucose concentration after being orally administered.

4,153,711

3-(3H-PYRAZOL-3-ONE)-2-(DISUBSTITUTED AMINOMETHYL)INDOLES AND PHARMACEUTICAL PREPARATIONS

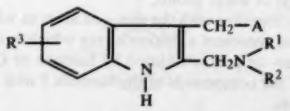
Harold Zinnes, Rockaway, and Neil A. Lindo, New Providence, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 19, 1977, Ser. No. 861,820

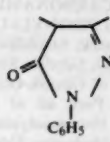
Int. Cl.[2] A61K *31/415;* **C07D** *403/06*

U.S. Cl. 424—273 P **6 Claims**

1. A compound of the formula



and pharmaceutically-acceptable acid addition salts thereof, wherein R^1 and R^2 are lower alkyl, R^3 is hydrogen, lower alkyl, halogen or lower alkoxy and A is



where R^4 is lower alkyl.

5. A central nervous system depressant pharmaceutical composition comprising a compound of claim 1 and a pharmaceutical carrier.

6. A method for inducing central nervous system depression which comprises administering internally a pharmaceutical composition of claim 5 to a mammal.

4,153,712

PYRAZOLYLACETANILIDE COMPOUNDS AND FUNGICIDAL COMPOSITIONS

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lorrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

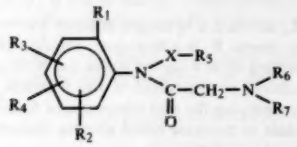
Division of Ser. No. 726,320, Sep. 24, 1976, Pat. No. 4,098,895. This application May 12, 1978, Ser. No. 905,313

Claims priority, application Switzerland, Sep. 30, 1975, 12650/75; Sep. 30, 1975, 12651/75

Int. Cl.[2] **C07D** *231/12, 231/16;* **A01N** *9/22*

U.S. Cl. 424—273 P **6 Claims**

1. A compound of the formula



(I)

wherein

R_1 represents a C_1–C_4-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

R_2 represents a hydrogen atom, a C_1–C_3-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

R_3 represents a hydrogen atom, a C_1–C_3-alkyl group or a halogen atom,

R_4 represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents R_1, R_2, R_3 and R_4 in the phenyl ring does not exceed 8, and

X represents $-CH_2-$ or

R_5 represents —COOR', or —COSR' wherein R' represents a methyl or ethyl group,

R_6 and R_7 together with the nitrogen atom to which they are attached represent a pyrazole ring which is unsubstituted or mono- or polysubstituted by halogen or C_1–C_3-alkyl,

and salts of the compounds of the formula I with inorganic or organic acids.

5. A fungicidal composition which contains as active component a fungicidally effective amount of a compound of the formula I according to claim 1, together with a suitable carrier therefor.

4,153,713

4-(POLYALKOXYPHENYL)-2-PYRROLIDONES (II)

Andreas Huth; Ralph Schmiechen; Wolfgang Kehr; Dieter Palenschat; Gert Paschelke, and Helmut Wachtel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

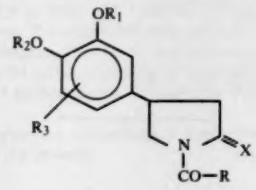
Filed Sep. 17, 1976, Ser. No. 724,213

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1975, 2541855

Int. Cl.[2] **A61K** *31/40;* **C07D** *207/26*

U.S. Cl. 424—274 **17 Claims**

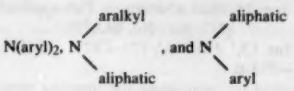
1. A 4-(polyalkoxyphenyl)-2-pyrrolidone of the formula



wherein R_1 and R_2 each are hydrocarbon of up to 18 carbon atoms or C_{1-5} alkyl, C_{2-5} alkenyl or C_{2-5} alkynyl each substituted by a halogen atom or by one of hydroxy, carboxy, alkoxy of 1–5 carbon atoms, alkoxycarbonyl of 1–5 carbon atoms in the alkoxy group, carboxamide, alkylcarboxamide, dialkylcarboxamido, amino, alkylamino or dialkyl, wherein alkyl in each instance is of 1–5 carbon atoms or R_1 and R_2 collectively are alkylene of 1–3 carbon atoms;

R_3 is hydrogen or methoxy;

R is O-aliphatic, O-aryl, O-aralkyl, NH_2-, NH-aliphatic, NH-aryl, NH-aralkyl, N(aliphatic)$_2$,



and "aliphatic" is C_{1-5} alkyl, C_{2-5} alkenyl or C_{2-5} alkynyl, aryl is phenyl, C_{1-4} alkylphenyl, naphthyl or biphenyl, and aralkyl is aromatic carbocyclic of up to 12 carbon atoms in the aromatic ring and 1–4 carbon atoms in the alkyl group;

X is oxygen or sulfur;

and optically active isomers and racemic mixtures thereof.

16. A pharmaceutical composition for the treatment of neurological and psychic disorders responsive to chlorpromazine therapy, comprising an amount of a compound of claim 1 effective to treat the disorders, in admixture with a pharmaceutically-acceptable carrier.

4,153,714

3-THIO-5-METHYL-7-OXO-1-AZABICYCLO[3,2,0]HEPT-2-ENE-2-CARBOXYLIC ACID ESTERS, THEIR PRODUCTION AND USE

Roger J. Ponsford, Horsham, England, assignor to Beecham Group Limited, United Kingdom

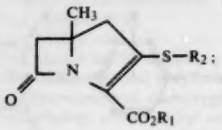
Filed Mar. 30, 1978, Ser. No. 891,710

Claims priority, application United Kingdom, Apr. 1, 1977, 13810/77

Int. Cl.[2] **C07D** *487/04;* **A61K** *31/40*

U.S. Cl. 424—274 **13 Claims**

1. A compound of the formula (II):



wherein R_1 is alkyl of 1 to 4 carbon atoms unsubstituted or substituted by alkoxyl of 1 to 4 carbon atoms or benzyl unsubstituted or substituted by alkoxyl of 1 to 4 carbon atoms, nitro or chloro and R_2 is a hydrocarbon of up to 7 carbon atoms unsubstituted or substituted by a CN, NO_2, OR_3, $NH.CO.R_3$ or CO_2R_3 group wherein R_3 is alkyl of 1 to 4 carbon atoms.

8. A pharmaceutical composition which comprises an antibacterially effective amount of a compound according to claim **1** in combination with a pharmaceutically aceptable carrier.

4,153,715

INDOLYL AMINO ACIDS USEFUL AS ANTIHYPERTENSIVE AGENTS

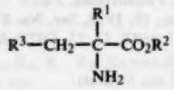
Joseph G. Atkinson, Montreal; Clarence S. Rooney, Beaconsfield; Yves Girard, Dollard des Ormeaux, all of Canada, and Engelhardt, Edward L. Gwynedd Valley, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 657,827, Feb. 13, 1976, Pat. No. 4,065,572. This application Aug. 16, 1977, Ser. No. 825,013

Int. Cl.[2] **A61K** *31/40;* **C07D** *209/04, 209/20*

U.S. Cl. 424—274 **5 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are hydrogen or lower alkyl and R^3 is 1-H-2-oxindol-5-yl.

3. A composition for treating hypertension comprising a therapeutically effective amount of a compound of claim **1** in combination with a pharmaceutically acceptable carrier.

4,153,716

OXY, THIO, SULFENYL AND SULFONYL DERIVATIVES OF 2-NITRO-3-PHENYLBENZOFURAN

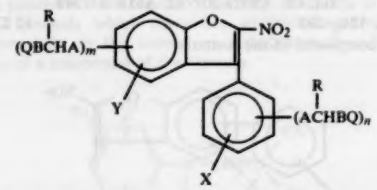
Robert A. Scherrer, White Bear Lake; Walton J. Hammar, St. Paul, and Richard M. Stern, Cottage Grove, all of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Filed Dec. 19, 1977, Ser. No. 862,015

Int. Cl.[2] **A61K** *31/345;* **C07D** *307/82*

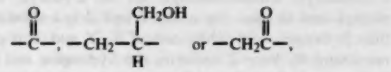
U.S. Cl. 424—274 **15 Claims**

1. A compound of the formula



wherein

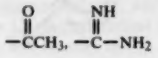
A is a carbon-carbon bond, methylene,



R is hydrogen, alkyl of one to ten carbon atoms or cyano,

B is oxygen, sulfur, sulfinyl or sulfonyl,

Q is hydrogen, amino, methylamino, N-bonded pyrrolidinyl, alkyl of one to four carbon atoms,



or nitroso,

m and n are independently zero or one and the sum of m and n is one or two,

X is hydrogen, methyl, fluorine, chlorine and bromine and

Y is hydrogen, methyl or ethyl, provided that when Q is amino, methylamino or pyrrolidinyl, B and R in the same moiety are respectively sulfonyl and hydrogen.

14. A method for arresting or inhibiting the growth of microorganisms comprising contacting microorganisms with a compound according to claim **1** in an amount sufficient to inhibit the growth of said microorganisms.

4,153,717

ANALGESIC N-(2-(FURYLMETHYLAMINO AND 2 -THIENYLMETHYLAMINO)CYCLO ALIPHATIC)BENZAMIDES

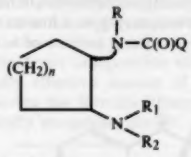
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 741,467, Nov. 12, 1976, Pat. No. 4,098,904. This application May 15, 1978, Ser. No. 906,271

Int. Cl.[2] **A61K** *31/34, 31/38;* **C07D** *307/54, 333/24*

U.S. Cl. 424—275 **8 Claims**

1. A compound of the formula

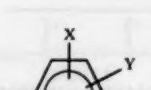


wherein the wavy line (~) at the 1-position of the cycloaliphatic ring denotes trans-stereo-configuration of the 1-position substituent with respect to the substituent in position 2 of the same cycloaliphatic ring; n is 1 to 8;

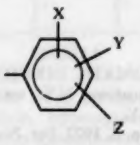
R is hydrogen or C_1 to C_3-alkyl;

R_1 is hydrogen or C_1 to C_3-alkyl; and

R_2 is a group of the formula

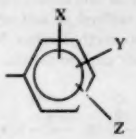


wherein T is —O— or —S—; and Q is 1-naphthyl, 2-naphthyl or the radical



wherein each of X, Y and Z is hydrogen, a halogen having an atomic number of from 9 to 35, nitro, methanesulfonyl, C_1 to

C_3-alkanoyl, trifluoromethyl, C_1 to C_3-alkyl, benzoyl or phenyl, and at least one of X, Y and Z is a substituent other than hydrogen, and when one of X, Y and Z is phenyl, the remaining X, Y or Z moieties are hydrogen, and when R is hydrogen, and n is 2 and Q is



which is monosubstituted X and Y are hydrogen and Z cannot be methanesulfonyl, or 3-chloro; and R must be C_1 to C_3-alkyl when n is 1, and when one of X, Y and Z is methanesulfonyl ($-SO_2CH_3$), R is C_1 to C_3-alkyl, and the pharmaceutically acceptable salts thereof.

7. A method for alleviating pain in a warm-blooded animal which comprises administering to the warm-blooded animal suffering pain a compound of formula I in claim 1 in an amount effective to relieve the pain.

4,153,718

ANTI-INFLAMMATORY COMPOUNDS

Alexander C. Goudie, Harlow, England, assignor to Beecham Group Limited, Great Britain

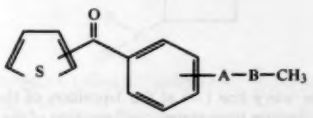
Division of Ser. No. 815,645, Jul. 14, 1977. This application Jul. 24, 1978, Ser. No. 927,394

Claims priority, application United Kingdom, Jul. 30, 1976, 31852/76

Int. Cl.[2] **A61K** *31/38;* **C07D** *333/6*

U.S. Cl. 424—275 **41 Claims**

1. A method of treating inflammation in humans and animals which comprises administering to a human or animal in need thereof an anti-inflammatory amount of a compound of the formula:



wherein A is $-CHRCH_2-$ or $-CH{=}CH-$ in which R is hydrogen or methyl and B is CO, CHOH or CHOCOR[1] wherein R^1 is phenyl, alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atom substituted by phenyl, or phenylalkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by phenyl substituted by a member selected from the group consisting of hydroxyl, acetoxyl, methoxyl, acetamido, amino or a nontoxic salt thereof, alkylamino of 1 to 4 carbon atoms in the alkyl moiety, dialkyl of 1 to 4 carbon atoms in each alkyl moiety and carboxyl.

4,153,719

AROMATIC DIKETONES

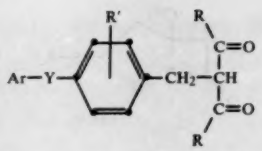
Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,470

Int. Cl.[2] **A61K** *31/36*

U.S. Cl. 424—282 **14 Claims**

1. A compound of the formula



wherein:

Ar is phenyl or phenyl substituted by 3,4-methylenedioxy or from one to two substituents selected from the group consisting of hydroxy, alkoxy of 1–3 carbon atoms and halogen;

Y is selected from the group consisting of CH_2, CH_2CH_2, CH=CH, O and OCH_2;

R is alkyl of 1 to 4 carbon atoms;

and

R′ is hydrogen or chlorine.

13. A composition for combatting viruses which comprises an anti-virally effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

14. A method for combatting viruses which comprises contacting the locus of said viruses with a composition containing an anti-virally effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

4,153,720

3-ACYL-5-ALKYL-2H-PYRAN-2,4,6-(3H,5H)-TRIONES AND THEIR 4-HYDROXY TAUTOMERS

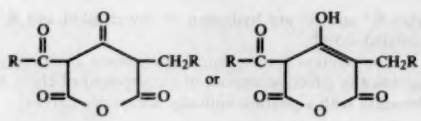
Theodore M. Resnick, Bala Cynwyd, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Filed Jan. 19, 1978, Ser. No. 870,792

Int. Cl.[2] **A61K** *31/35;* **C07D** *309/22*

U.S. Cl. 424—283 **6 Claims**

1. A compound of the formula:



in which R is a lower alkyl of from 1–6 carbon atoms.

6. The method of inhibiting the symptoms of asthma which comprises administering to a subject in need thereof a therapeutically effective amount for producing said inhibition of a compound of claim 1.

4,153,721

DERIVATIVES OF 2-NITROBENZOFURAN

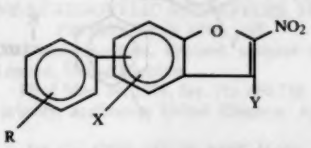
Walton J. Hammar, and Mark A. Rustad, both of St. Paul, Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Filed Dec. 19, 1977, Ser. No. 862,014

Int. Cl.[2] **C07D** *307/82;* **A61K** *31/345*

U.S. Cl. 424—285 **12 Claims**

1. A compound of the formula



wherein

R is hydrogen, carboxyl, carboxymethyl, hydroxymethyl, hydroxyethyl or ureidomethyl,
X is hydrogen or carboxyl and
Y is methyl, ethyl, phenyl or carboxyphenyl, provided that the compound contains one and only one group selected from carboxyl, carboxymethyl, carboxyphenyl, hydroxymethyl, hydroxyethyl or ureidomethyl and provided further that when R is carboxymethyl, Y is methyl or ethyl, and, when an acid group is present, acid chlorides, lower alkyl esters and pharmaceutically acceptable salts thereof.

11. A method for arresting or inhibiting the growth of microorganisms comprising contacting microorganisms with a compound according to claim **1** in an amount sufficient to arrest or inhibit the growth of said microorganisms.

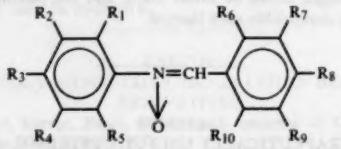
4,153,722

METHOD OF TREATMENT

Henry F. Campbell, Lansdale; Norman J. Santora, Roslyn, and George H. Douglas, Malvern, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Oct. 6, 1977, Ser. No. 839,961
Int. Cl.[2] **A61U** *31/275*
U.S. Cl. 424—304 **4 Claims**

1. A method of treating inflammation in warm-blooded animals comprising the topical administration to said animal of an effective amount of a pharmaceutically-active compound of the formula:



where:

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9 and R_{10} may be the same or different and are:
hydrogen,
alkyl,
cyano,
nitro,
amino,
haloloweralkoxy,
halooweralkyl,
halo,
loweralkoxy and
hydroxy.

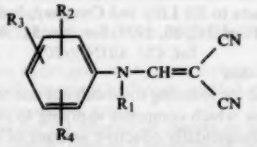
4,153,723

ANTHELMINTIC AGENTS

Jozef Drabek, Oberwil, and Alfred Meyer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,650
Claims priority, application Switzerland, Jan. 10, 1977, 267/77; Dec. 7, 1977, 15002/77
Int. Cl.[2] **A01N** *9/20;* **C07C** *121/78*
U.S. Cl. 424—304 **5 Claims**

1. A process for the control of parasitic helminths in warm blooded animals which comprises administering orally or subcutaneously to the animal an anthelmintically effective amount of a compound of the formula



wherein
R_1 represents halogenalkyl containing 1 to 6 carbon atoms in the alkyl moiety, C_3–C_4 alkenyl, C_3–C_5 alkenyl C_3–C_5 alkynyl or a benzyl radical which is unsubstituted or substituted by 1 to 2 halogen atoms, 1 to 2 C_1–C_2 alkyl radicals, or by a cyano or a trifluoromethyl group,
R_2 represents hydrogen, C_1–C_4 alkyl, halogen, the trifluoromethyl group, the nitro group or the cyano group,
R_3 represents hydrogen, halogen, the trifluoromethyl group or the nitro group, and
R_4 represents hydrogen or halogen, with the proviso that, if R_1 represents the C_3 alkynyl radical or the unsubstituted benzyl group, R_2 and R_3 may not be trifluoromethyl.

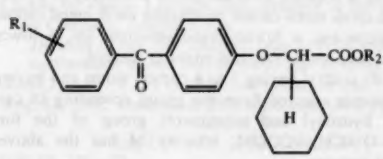
4,153,724

BENZOYL PHENOXY ACETIC ACID DERIVATIVES

Yasuhiko Hamazaki; Toshiyuki Yamamoto, both of Tokyo; Shozo Kawabata, Kami-Fukuoka; Kenji Seri, Tokyo; Masao Sakasai, Tokyo; Reiko Sato, Tokyo, and Nobuo Ishiyama, Tokyo, all of Japan, assignors to Kaken Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1977, Ser. No. 860,478
Claims priority, application Japan, Dec. 27, 1976, 51/156256; Aug. 8, 1977, 52/94138
Int. Cl.[2] **C07C** *69/95, 65/20;* **A61K** *31/19, 31/215*
U.S. Cl. 424—308 **4 Claims**

1. A benzoyl phenoxy acetic acid derivative having the formula



(I)

wherein R_1 represents a hydrogen or halogen atom, a lower alkyl group, or a lower alkoxyl group; and R_2 represents a hydrogen atom or a lower alkyl group.

4. An antihyperlipidemic composition which comprises an antihyperlipidimically effective amount of the benzoyl phenoxy acetic acid having the formula (I) according to claim **1** and a pharmaceutically acceptable carrier.

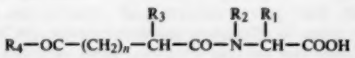
4,153,725

RELIEVING ANGIOTENSION RELATED HYPERTENSION WITH CARBOXYALKYLACYLAMINO ACIDS

Miguel A. Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 684,605, May 10, 1976, Pat. No. 4,105,789. This application May 4, 1978, Ser. No. 903,290
Int. Cl.[2] **A61K** *31/195, 31/215;* **C07C** *103/84*
U.S. Cl. 424—309 **19 Claims**

1. A method for relieving angiotensin related hypertension in mammalian species suffering therefrom which comprises administering a composition containing an effective amount of a compound of the formula



and salts thereof, wherein
R_1 is hydrogen, lower alkyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxyphenyl-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, or carbamoyl-lower alkylene;
R_2 is hydrogen or lower alkyl;
R_3 is phenyl-lower alkylene;

R_4 is hydroxy or lower alkoxy; and n is 1 or 2.

4,153,726

SKIN PROTECTION AGENTS CONTAINING POLYETHERCARBOXYLIC ACIDS

Gerhard Borggrefe, Düsseldorf; Hinrich Möller, Düsseldorf-Benrath; Peter Lorenz, Langenfeld; Rainer Osberghaus, Düsseldorf-Urdenbach; Christian Gloxhuber, Haan, and Siegfried Braig, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf, Fed. Rep. of Germany

Filed Jan. 28, 1975, Ser. No. 544,809

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1974, 2404047

Int. Cl.[2] A61K *31/225, 31/23*

U.S. Cl. 424—313 **3 Claims**

1. A process for the care and protection of the skin of warm-blooded animals comprising topically applying to the skin a safe but effective amount as moisturizing agent of a cosmetic moisturizing composition consisting essentially of from about 1% to about 20% by weight of at least one polyethercarboxylic acid compound having the formula

$$R_1—O—CH_2—COOM$$

wherein M is selected from the group consisting of hydrogen, an alkali metal cation, an alkaline earth metal cation, ammonium ion, a lower-alkyl-ammonium ion, a lower alkanol-ammonium ion, and mixtures thereof,

wherein R_1 is alkyl having 1 to 8 carbon atoms and having substitutents selected from the group consisting of carboxyl, hydroxyl and substituents group of the formula—O—CH_2—COOM, wherein M has the above-defined meanings,

with the proviso that there are at least two carboxyl groups in the molecule of said acid compound

and the remainder being inert cosmetic excipients for the care and protection of the skin.

4,153,727

PHARMACEUTICAL COMPOSITIONS OF A PROSTAGLANDIN COMPOUND FOR RECTAL USE IN TREATING ASTHMA

Hidefumi Matsui, Kitamoto; Kenichi Tomioka, Okegawa; Hiroitsu Kawada, Kawagoe, and Hiroo Maeno, Shiki, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

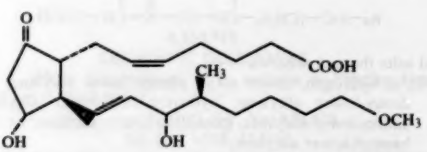
Filed Jan. 9, 1978, Ser. No. 867,932

Claims priority, application Japan, Jan. 20, 1977, 52-5298

Int. Cl.[2] A61K *31/19, 31/215*

U.S. Cl. 414—317 **9 Claims**

1. A method of treating bronchial asthma comprising rectally administering an effective amount of a composition which comprises 11α,15(S)-Dihydroxy-20-methoxy-16(S)-methyl-9-oxo-5(cis),13(trans)-prostadienoic acid represented by the formula



dissolved or dispersed in a lipophilic or hydrophilic base.

4,153,728

PHENOXYALKYLCARBOXYLIC ACID COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Hans P. Wolff, Mannheim; Ernst-Christian Witte, Mannheim; Max Thiel, Mannheim; Harald Stork, Mannheim-Feudenheim, and Egon Roesch, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

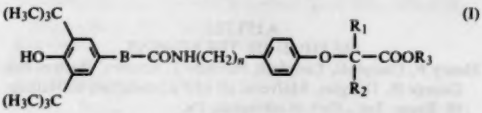
Filed Oct. 18, 1976, Ser. No. 733,542

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1975, 2546996

Int. Cl.[2] C07C *101/42;* **A01N** *9/20*

U.S. Cl. 424—319 **18 Claims**

1. Phenoxyalkylcarboxylic acid compound of the formula:



(I)

wherein

B is a valency bond or a straight-chained or branched, saturated or unsaturated hydrocarbon radical containing up to 3 carbon atoms;

n is 1 or 2 and

R_1, R_2 and R_3, which can be the same or different, are hydrogen atoms or lower alkyl; and the pharmacologically compatible salts thereof.

4,153,729

THERAPEUTICALLY USEFUL CYSTEINOL AND HOMOCYSTEINOL DERIVATIVES

Christian J. M. Warolin; Pierre Muller, and Roger Zaoui, all of Paris, France, assignors to Recherches Pharmaceutiques et Scientifiques, France

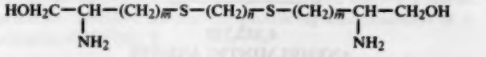
Filed Feb. 6, 1978, Ser. No. 875,571

Claims priority, application France, Feb. 7, 1977, 77 03308

Int. Cl.[2] A61K *31/13;* **C07C** *149/42, 91/12*

U.S. Cl. 424—325 **8 Claims**

1. A pharmaceutical composition useful in the treatment of lipid disturbances which comprises, as active ingredient a hypolipemic amount of, a compound corresponding to the general formula I



(I)

in which n is equal to 0 or represents a whole number from 1 to 10 and m represents the number 1 or 2 or a pharmacologically acceptable salt of such a compound, together with a pharmacologically acceptable carrier or diluent.

4,153,730

FUNGICIDAL AND HERBICIDAL METHODS

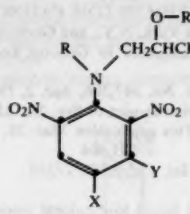
James R. Beck, and Robert P. Gajewski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 20, 1977, Ser. No. 817,469

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—330 **18 Claims**

1. A method for reducing the incidence and severity of grape downy mildew which comprises applying to the foliage of the host plant a fungicidally-effective amount of a compound of the formula



wherein
R is C_1–C_4 alkyl or C_3–C_4 alkenyl;
R^1 is hydrogen or

X is hydrogen, C_1–C_4 alkyl, trifluoromethyl, halo, or $-SO_2NH_2$; and
Y is hydrogen or amino;
with the exception that when R^1 is

Y can only be hydrogen.

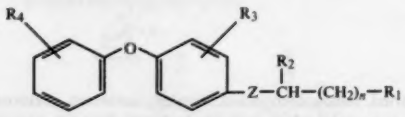
4,153,731

PHENOXY (BENZYLOXY/BENZYLTHIO) BENZENE DERIVATIVES

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

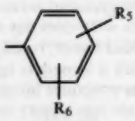
Division of Ser. No. 729,055, Oct. 4, 1976, Pat. No. 4,094,989, which is a division of Ser. No. 460,404, Apr. 12, 1974, Pat. No. 3,987,102. This application Mar. 13, 1978, Ser. No. 885,719
Claims priority, application Switzerland, Apr. 18, 1973, 5635/73; Mar. 18, 1974, 3705/74
Int. Cl.[2] A01N *9/12*
U.S. Cl. 424—337 **8 Claims**

1. A compound of the formula



(I)

wherein
n represents the numbers 0 or 1,
Z represents oxygen, or sulphur,
R_1 represents



wherein
R_5 represents C_3-C_5-alkenyloxy, C_3-C_5-haloalkenyloxy, or C_3-C_5-alkynyloxy,
R_6 represents hydrogen, halogen, methyl, ethyl, isopropyl or methoxy,
R_2 represents hydrogen, methyl or ethyl, and
R_3 and R_4 each represent hydrogen, methyl, ethyl, methoxy, ethoxy, nitro or halogen.

6. A method for the control of insects or members of the order Acarina which comprises applying to the locus thereof an insecticidally or acaricidally effective amount of a compound according to claim 1.

4,153,732

ANTICARIOGENIC COMESTIBLE

Joseph C. Muhler, Howe; Carl J. Kleber, Fort Wayne, both of Ind., and Ray G. Kelly, Kirkwood, Mo., assignors to Indiana University Foundation, Bloomington, Ind.

Continuation-in-part of Ser. No. 784,070, Apr. 4, 1977, abandoned, and Ser. No. 855,740, Nov. 29, 1977, which is a continuation-in-part of Ser. No. 787,752, Apr. 15, 1977, abandoned, which is a continuation of Ser. No. 654,058, Jan. 30, 1976, abandoned, said Ser. No. 784,070, is a continuation-in-part of said Ser. No. 654,058. This application Feb. 21, 1978, Ser. No. 879,632
Int. Cl.[2] A23L *1/30;* A23G *3/00;* A21D *2/02, 2/22*
U.S. Cl. 426—72 **17 Claims**

1. A cariostatic additive for comestibles consisting essentially of anticariogenically effective and nontoxic amounts of at least one soluble aluminum ion containing salt and a member selected from the group consisting of adipic acid, ascorbic acid, and mixtures thereof, wherein the aluminum salt is present at a level of about 0.01 up to about 0.10% calculated as aluminum ion and the acid member is present at a level of greater than 0 up to about 6% by weight of the comestible.

4,153,733

MICRONIZED WAFER

Chardo W. Pierce, Lubbock, Tex., assignor to Pierce Micronizing Company, Amarillo, Tex.

Division of Ser. No. 250,662, May 5, 1972, abandoned, continuation of Ser. No. 854,693, Sep. 2, 1969, Pat. No. 3,694,220, which is a continuation-in-part of Ser. No. 576,353, Aug. 31, 1966, abandoned. This application Jan. 13, 1976, Ser. No. 648,769
Int. Cl.[2] A23L *2/24;* A23K *1/00*
U.S. Cl. 426—72 **6 Claims**

1. An edible food product comprising:
(a) a small grain seed selected from a group consisting of wheat, rye, barley, and sorghum,
(b) said seed being
(i) flat, and
(ii) wafer shaped,
(iii) with a moisture content of about eight percent and having
(iv) a ridge pattern on the surface thereof, and
(v) a slight puffed appearance,
(c) said seed characterized by being processed by
(i) about 20 to 30 seconds of infrared radiation, and
(ii) immediate flat rolling thereafter by rollers having grooves therein to form said ridge pattern.

4,153,734

DRY COLORING MATERIAL FROM BY-FOOD PRODUCT OF STARCH MANUFACTURE

Michel Huchette, and Guy Bussiére, both of Lestrem, France, assignors to Roquette Freres, Lestrem, France

Filed Sep. 15, 1977, Ser. No. 833,610
Claims priority, application France, Sep. 15, 1976, 76 27711
Int. Cl.[2] A23L *1/275*
U.S. Cl. 426—250 **13 Claims**

1. A dry powdery food material having more than about 85% of dry matter consisting essentially of about one-third starch and from about two-thirds proteins said material being obtained from the by-product, rich in proteins, of corn starch manufacture said powdery coloring material having its granulometry corresponding to the following standards:
100% by weight of particles less than 200 microns
95% by weight of particles less than 147 microns
60% by weight of particles less than 100 microns and preferably

100% by weight of particles less than 200 microns
98% by weight of particles less than 147 microns
75% by weight of particles less than 100 microns
said powdery coloring further being defined by having no grain perceived in the course of a butter taste test including 1.25% of coloring material,
a light reflexion loss, for the four following wavelengths: 5400, 5770, 6200 and 6810 A, not exceeding 15%,
the minimum height of the colored phase in the course of a decantation test after 10 minutes being 9.5 cm and,
a viscosity greater than 500 cps.

4,153,735

LUBRICANT-BINDER ADDITIVE FOR DENSIFYING ANIMAL FEED MATERIAL

Richard P. Mommer, Loveland, Colo., assignor to Uniscope, Inc., Johnstown, Colo.

Filed Nov. 1, 1977, Ser. No. 847,660
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—285 **40 Claims**

1. In an animal feed composition intended for domesticated quadrupeds and poultry, the improvement which comprises the inclusion of a lubricant-binder additive composition comprising a mixture of:
(a) a salt of a fatty acid;
(b) a hydrogenated lipid; and
(c) a water soluble anionic polymer;
wherein the fatty acid salt varies from about 90 to about 50%, the hydrogenated lipid varies from about 40 to about 1%, and the anionic polymer varies from about 15 to about 0.5%, by weight of the additive composition; and
wherein said additive composition varies from about 0.01 to about 0.2% by weight of the total composition.

40. A method for pelletizing particulate, granular animal feed material intended for domesticated quadrupeds and poultry comprising:
contacting said fee material with a lubricant-binder additive composition comprising a mixture of
(a) tallow soap;
(b) hydrogenated tallow glycerides; and
(c) polyacrylamide or gum Karaya, or both;
in the presence of steam and pressure forming the total feed material into pellets; said additive composition having a particle size varying from about minus 25 mesh to about minus 75 mesh, U.S. Sieve Scale and varying from about 0.1 to about 0.2% by weight of the total feed material, and wherein the ratio of (a):(b):(c) varies from about 90–75:20–10:15–1, respectively, in parts by weight.

4,153,736

METHOD FOR DISPLAYING AND MAINTAINING PRECOOKED FOOD IN A MOIST CONDITION AT A SUITABLE SERVING TEMPERATURE

Charles M. Lents, 9107 Dartbrook, Apt. 4, San Antonio, Tex. 78240

Filed Jul. 8, 1977, Ser. No. 813,954
Int. Cl.[2] A23L *1/01*
U.S. Cl. 426—302 **5 Claims**

1. A method for continuously maintaining pre-cooked food items in a moist condition at a suitable serving temperature, comprising the steps of:
periodically immersing a pre-cooked food item contained in a basting tray in a heated basting pan containing a heated basting liquid;
draining substantially all the basting liquid from the food and tray after the food and tray emerges from the basting liquid at a controlled rate sufficient to maintain the food item moist and to prevent sogginess of the food item and to avoid splashing of the draining basting liquid out of the basting pan.

4,153,737

CONCENTRATED LIQUID LOW CALORIE SWEETNER

Jeffrey H. Berg, New York, N.Y., and Gerhard J. Haas, Woodcliff Lake, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 347,306, Apr. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 239,792, Mar. 30, 1972, abandoned. This application Mar. 28, 1977, Ser. No. 781,604
Int. Cl.[2] A23L *1/236*
U.S. Cl. 426—548 **10 Claims**

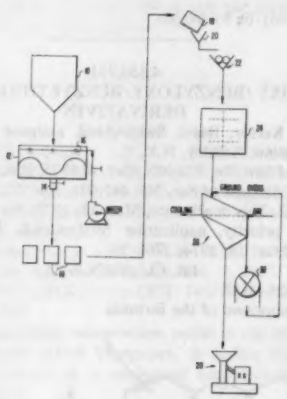
1. A concentrated liquid low calorie sweetening composition comprising a mixture of propylene glycol and at least 5% by weight of a dipeptide salt selected from the group consisting of the sodium salt of L-aspartyl-L-phenylalanine methyl ester and the potassium salt of L-aspartyl-L-phenylalanine methyl ester.

4,153,738

TEXTURED VEGETABLE PROTEIN FLAKES

Kenneth S. Ronai, Ridgewood; Henry C. Spanier, Ramsey; Felice Scaglione, Lodi, and Edward F. Wisniewski, Roselle, all of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Continuation of Ser. No. 516,136, Oct. 18, 1974, Pat. No. 4,103,034. This application Jun. 10, 1976, Ser. No. 694,800
Int. Cl.[2] A23B *7/02;* **A23J** *3/00*
U.S. Cl. 426—656 **3 Claims**



1. A dried, flakes, compacted, deoiled, laminated, textured soy protein material which instantly hydrates; does not expand or become spongelike upon hydration; is palatable and edible upon hydration; has a protein content of 30 percent or more; has an improved bland flavor, lacking the bitter beany flavor and taste normally associated with soy; physically blends in well with fish or poultry because of its similar layered or flaked texture, as opposed to granular textured vegetable protein which does not blend in well; does not require flavor masking agents because of its bland flavor; readily accepts the flavor of the food system in which it is used; is light-colored, and, upon hydration, maintains its structural integrity, has cohesiveness, and does not disintegrate into a pasty consistency as do other soy products.

4,153,739

METHOD FOR COLLECTING BLOOD

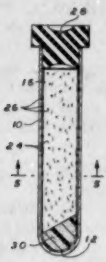
Stephen B. Kessler, Guttenberg, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Jun. 30, 1977, Ser. No. 811,947
Int. Cl.[2] A61K *47/00;* **B32B** *17/10, 27/36*
U.S. Cl. 427—2 **7 Claims**

1. A method of manufacturing a storage stable blood collec-

tion assembly including a siliceous surface component for blood clot activation and a silicone based gel with a potential of contacting the surface and deactivating blood clot activation, which comprises;

providing the siliceous surface component;



coating the siliceous surface with a water soluble, inert, film forming barrier material; and

disposing said silicone based gel within the assembly whereby it may come into contact with the coated surface.

4,153,740

ORGANO-SULFUR COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Wilkins Township, Allegheny County; Joseph F. Meier, Export, and David C. Phillips, Penn Hills Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

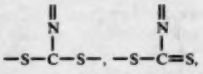
Division of Ser. No. 699,561, Jun. 24, 1976, Pat. No. 4,100,327. This application Jan. 11, 1978, Ser. No. 868,576

Int. Cl.[2] G01N *15/06*

U.S. Cl. 427—8 **20 Claims**

1. A method of protecting electrical apparatus from damage due to overheating and for thereafter determining the location of said overheating, said apparatus including a gas stream and a monitor for detecting particles in said gas stream and for emitting a signal when said particles are detected comprising:

(A) preparing a composition which comprises at least one non-metallic, non-ionic (covalent) organo-sulfur compound containing the group



or mixtures thereof, and a solution of a resinous carrier curable at room temperature and stable at 60° C., and unreactive with said organo-sulfur compound at its thermoparticulation temperature;

(B) applying said composition to said electrical apparatus at positions exposed to said gas stream;

(C) evaporating said solvent; and

(D) monitoring said gas stream for the presence of particles therein.

4,153,741

METHOD FOR FORMING A SURFACE RELIEF PATTERN IN A POLY(OLEFIN SULFONE) LAYER

Eugene S. Poliniak, Willingboro, and Nitin V. Desai, Edison, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 30, 1976, Ser. No. 710,133

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—38 **12 Claims**

1. A method for forming a surface relief pattern in a poly(3-methyl-1-cyclopentene sulfone) layer which comprises:

(a) exposing the polymer layer to a modulated beam of electrons whereby the portions of the polymer layer exposed to the electron beam becomes more soluble in a solvent developer than the unexposed portions; and

(b) contacting the exposed polymer layer to a solvent developer which is selected from the group consisting of a mixture of 2-methylcyclohexanone and 2-methylcyclohexanol and a mixture of benzene and 2-methylcyclohexanol whereby a surface relief pattern is formed in the polymer layer.

7. A method for forming a surface relief pattern in a metal layer which comprises:

(a) exposing a poly(3-methyl-1-cyclopentene sulfone) layer in contact with the metal layer to a modulated beam of electrons whereby the portions of the polymer layer exposed to the electron beam become more soluble in a solvent developer than the unexposed portions;

(b) contacting the exposed polymer layer to the solvent developer which is selected from the group consisting of a mixture of 2-methylcyclohexanone and 2-methylcyclohexanol and a mixture of benzene and 2-methylcyclohexanol whereby a surface relief pattern is formed in the polymer layer; and

(c) bombarding the polymer layer with sufficient ions to substantially remove the polymer layer and etch the surface relief pattern into the metal layer.

4,153,742

MANUFACTURE OF ELECTRODES

Hugo Boehn; Wolfram Treptow, both of Ludwigshafen; Gerd Wunsch, Speyer; Volker Kiener, Weisenheim; Hermann Meyer, Frankenthal, and Gotthard Csizi, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 8, 1977, Ser. No. 813,972

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638218

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—126 **3 Claims**

1. A process for manufacture of an electrode having an electrode base of a valve metal with an electrochemically active coating thereon, which comprises treating said electrode base of a valve metal with hydrogen in a hydrogen atmosphere at from 20° to 500° C., and applying to the treated base an electrochemically active coating of at least one oxide, carbide, nitride or sulfide of palladium, platinum, rhodium, iridium, ruthenium or osmium and at least one oxide of a valve metal, in an amount of more than 50 mole percent of the coating material.

4,153,743

CONCRETE SURFACE TREATING MATERIAL AND METHOD OF TREATING CONCRETE SURFACES

John A. Caramanian, 1021 Summer St., Cincinnati, Ohio 45204

Continuation-in-part of Ser. No. 782,568, Mar. 29, 1977, Pat. No. 4,116,915. This application Jun. 29, 1978, Ser. No. 920,205

Int. Cl.[2] B05C *1/16*

U.S. Cl. 427—136 **8 Claims**

1. A sealant composition for treating concrete surfaces consisting essentially of the following components: 25 to 40 parts epoxy resin, 10 to 20 parts of organic polysulfide elastomer which is compatible with the epoxy resin, 40 to 50 parts ethylene glycol monoethyl ether acetate, 15 to 25 parts ethylene glycol monobutyl ether, 30 to 45 parts of methyl ethyl ketone, the remainder of the composition comprising additional solvent diluents, and wherein the composition has a viscosity of 9 to 24 seconds measured with a Number 4 Ford Cup.

4,153,744

PROCESS FOR IMPARTING FLAME RESISTANCE AND RESISTANCE TO ULTRAVIOLET LIGHT-INDUCED SHADE CHANGE TO VAT-DYED CELLULOSIC TEXTILE MATERIALS

Kenneth H. Remley, Warren, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 7, 1977, Ser. No. 849,283
Int. Cl.[2] B05D *1/38, 3/10*
U.S. Cl. 427—160 8 Claims

1. A process for imparting resistance to ultraviolet light-induced shade change to a vat-dyed cellulosic flame resistant textile material which comprises:

(a) impregnating a cellulosic textile material with an aqueous solution of a tetrakis(hydroxymethyl)phosphonium salt, a mixture of tetrakis(hydroxymethyl)phosphonium salts, or a partially polymerized methylol phosphorus material to deposit thereon about 3–7% phosphorus based on the weight of the untreated textile material;

(b) partially drying the impregnated textile material;

(c) contacting the partially dried textile material with about 2–6 gram-moles of gaseous ammonia per gram-atom of phosphorus present thereon to deposit therein a substantially water-insoluble phosphorus-containing polymer;

(d) contacting the ammoniated textile material with an oxidizing solution containing about 18–25% hydrogen peroxide, 30–50% acetic acid, and 50–30% water, at a temperature above about 50° C. for a period of from about 5–25 minutes;

(e) rinsing the oxidized textile material with water, and drying.

4,153,745

SWEAT RESISTANT GAS PROTECTIVE MATERIAL

John A. Hart, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Jan. 30, 1978, Ser. No. 873,525
Int. Cl.[2] B05D *5/00*
U.S. Cl. 427—244 4 Claims

1. A method of minimizing the adverse effect of sweat and sebum on a laminated fabric material comprising an air- and water vapor-permeable open cell flexible polyurethane foam resistant to passage therethrough of noxious chemicals in liquid or vapor form, said foam being bonded to an air- and water vapor-permeable fabric backing, said foam having dispersed therein particulate activated carbon adsorbent material for the noxious chemicals, which particulate adsorbent material is bonded in said foam by an organic binder substantially free from substance which would substantially deactivate said adsorbent material, and an air- and water vapor-permeable fabric backing to which the foam is bonded, which method comprises:

impregnating the adsorbent material with a first liquid organic polymeric water- and oil-repellent substance containing a high proportion of perfluorocarbon chains, said repellant substance being compatible with said organic binder and being of a type which does not reduce to any significant extent the adsorptive capacity of said adsorbent, said impregnating occurring by mixing as an aqueous dispersion said activated carbon adsorbent material and said repellant substance;

applying said aqueous dispersion of activated carbon adsorbent material and repellant substance to the laminated fabric material thereby impregnating the adsorbent material within the foam;

drying the impregnated laminated fabric material;

dissolving in an organic solvent a second organic polymeric water- and oil-repellant substance, different from said first substance, but also containing a high proportion of perfluorocarbon chains, being compatible with the organic binder, and being of a type which does not reduce to any significant extent the adsorptive capacity of the adsorbent; and

applying the organic solvent-repellent solution to the dried impregnated laminated fabric material.

4,153,746

METHOD OF SENSITIZING COPPER SURFACES WITH SENSITIZING SOLUTION CONTAINING STANNOUS IONS, PRECIOUS METAL IONS AND EDTA

Hans D. Kilthau, Boeblingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,332
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659680
Int. Cl.[2] C23C *3/02*
U.S. Cl. 427—304 4 Claims

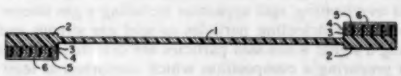
1. In a method of sensitizing surfaces which include areas of copper for the subsequent electroless metallization, where the surface to be sensitized is processed with a sensitizing solution with a pH of less than 1 containing precious metal ions, stannous ions in stoichiometric surplus, and a haloid acid, the improvement comprising; admixing to the sensitizing bath a complex forming compound for copper ions selected from the group consisting of ethylene diamine tetra-acetic acid and alkali metal salts of ethylene diamine tetra-acetic acid to thereby maintain a low concentration of free copper ions and contacting said surfaces with said sensitizing bath.

4,153,747

WRAP AROUND HEAT SHRINKABLE CLOSURE

Richard A. Young, Cupertino, and Mark J. Stanek, Sunnyvale, both of Calif., assignors to Sigmaform Corporation, Santa Clara, Calif.

Filed Apr. 3, 1978, Ser. No. 892,673
Int. Cl.[2] C09J *7/02*
U.S. Cl. 428—40 4 Claims



1. A wrap around heat shrinkable closure comprising a generally rectangular sheet of heat shrinkable polymer having a large central section which has been hot stretched and cooled while in stretched condition and two small flat unstretched end sections integral with the central section, each end section having a layer of non-silicone adhesive covering one of its surfaces, a layer of silicone adhesive covering and adhering to said non-silicone adhesive layer and a peelably removable cover layer covering the surface of the silicone adhesive layer, said several layers lying on the upper surface of one end section and on the lower surface of the other end section.

4,153,748

WEATHER-RESISTANT VULCANIZABLE COVERING

Dieter Bischoff, Furth, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jun. 20, 1977, Ser. No. 808,412
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628741
Int. Cl.[2] B32B *3/00*
U.S. Cl. 428—57 7 Claims

1. A covering made of vulcanizable material, resistant to the effects of water and weather, comprising at least three superimposed vulcanizable sheets, at least one inner layer being elastomeric and containing a vulcanization accelerator, at least the outer layers being weldable.

7. A covering according to claim 1 in side-by-side overlapping relationship with and welded to a further like cover.

4,153,749

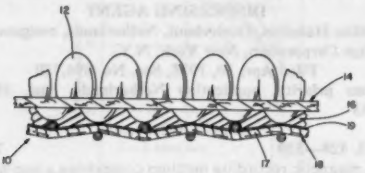
CARPETING

William G. Klein, Stoughton, Mass., assignor to United Technical Products, Inc., Westwood, Mass.

Continuation of Ser. No. 633,953, Nov. 20, 1975, abandoned, which is a continuation of Ser. No. 414,309, Nov. 9, 1973, abandoned. This application Jun. 17, 1977, Ser. No. 807,490

Int. Cl.[2] D03D *27/00;* B32B *7/00*

U.S. Cl. 428—95 14 Claims



1. In an antistatic carpet system where at least one out of every 40 carpet yarns is electrostatically conductive, the carpet yarns are tufted into a primary backing having a non-conductive polymer coating applied thereto securing the carpet yarns and a secondary backing, the system characterized in that the secondary backing further comprises a polymer conductive layer that is in direct contact with the polymer coating of the primary backing but is electrically isolated and not in direct contact with the carpet yarns or the electrostatically conductive yarns.

4,153,750

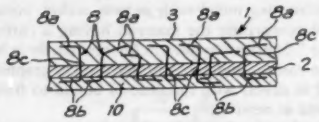
FLOOR AND/OR WALL COVERING

Pierre C. Piquilloud, Saint-Cloud, France, assignor to Sommer Exploitation, Neuilly sur Seine, France

Filed Apr. 26, 1978, Ser. No. 900,228

Int. Cl.[2] B32B *5/06, 5/08, 5/12, 31/16*

U.S. Cl. 428—107 12 Claims



1. A floor and/or wall covering of the non-woven type comprising at least one layer of parallel juxtaposed textile threads, as well as a supporting layer to which are individually fixed the said textile threads formed from a plurality of more or less twisted fibres, wherein the textile threads have a diameter of at least 1 mm and said twisted fibres have a diameter of at most 0.1 mm, wherein a small portion of the fibres of each textile thread is fixed to the supporting layer by low density needling without destroying the continuity and the initial appearance of each textile thread, wherein each of the fixing fibres have two end portions disposed more or less parallel to said supporting layer and a middle part extending transversely to said supporting layer, one of said end portions being frictionnally attached to the other fibres of the corresponding textile thread and the other end portion being embedded in a coating applied to the back of said supporting layer.

11. A manufacturing process for a floor and/or wall covering according to claim 1, wherein the threads of the layer of threads are applied to the supporting layer by a relatively low density needling operation, so that a small portion of the fibres of each textile thread has one of its end portions extending through and beyond said supporting layer and the other end portion still remaining within the fibre-assembling forming said textile thread and wherein the fibre end portions extending beyond said supporting layer are bent parallel to said layer and are recovered and embedded in a coating applied to the back side of said supporting layer.

12. A manufacturing process according to claim 11, wherein the supporting layer comprises a shrinkable textile fabric which undergoes a shrinking treatment after fixing the threads of the layer of threads thereto by needling.

4,153,751

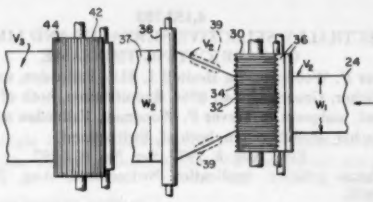
PROCESS FOR STRETCHING AN IMPREGNATED FILM OF MATERIAL AND THE MICROPOROUS PRODUCT PRODUCED THEREBY

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Biax-Fiberfilm Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 614,018, Sep. 17, 1975, and Ser. No. 563,623, Mar. 31, 1975, abandoned. This application Mar. 22, 1977, Ser. No. 780,034

Int. Cl.[2] B32B *3/26, 27/04;* B29L *17/02;* B29D *27/00*

U.S. Cl. 428—304 12 Claims



6. A process for bi-axially stretching incremental portions of a film comprised of a blend of a thermoplastic orientable polymer with an incompatible second phase selected from the group consisting of an incompatible polymer, or inorganic material, or a polymer matrix having an inorganic filler to produce a microporous film which comprises:

(a) passing said film through a solution of an impregnating chemical;

(b) introducing said film into a nip of interdigitating rollers having grooves parallel to the axis of said rollers;

(c) controlling the velocity of introduction of said film into said nip to assume and maintain the velocity substantially identical to the surface velocity of said rollers to prevent slipping of said film and thereby to longitudinally stretch incremental portions of said film by a deflection of said film into the shape of said grooves;

(d) withdrawing said film from said rollers at a velocity greater than the rotational velocity of said rollers;

(e) introducing said film into a nip of interdigitating rollers having grooves substantially perpendicular to the axis of said rollers;

(f) controlling the velocity of introduction of said web into said nip to assume and maintain the velocity substantially identical to the surface velocity of said rollers to prevent narrowing of said film prior to introduction into said nip thereby to laterally stretch incremental portions of said web by deflection of said film into the shape of said grooves;

(g) withdrawing said web from said rollers at a velocity substantially corresponding to the velocity of introduction; and

(h) collecting the thus stretched film.

4,153,752

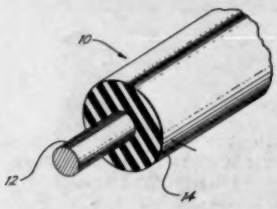
DIELECTRIC INSULATING POLYOLEFIN COMPOUNDS AND CONDUCTOR PRODUCTS INSULATED THEREWITH

Burton T. MacKenzie, Jr., Lawrence, Kans.; Maurice Prober, Fairfield, and Stanley E. Kiersztyn, Orange, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 19, 1977, Ser. No. 843,614

Int. Cl.² B32B *25/20*

U.S. Cl. 428—379 **8 Claims**



1. An electrical conductor with a polymeric dielectric insulation comprising a metal conductor insulated with a cross-link cured, ethylene containing polyolefin compound containing cyanoalkyl polysiloxane fluid.

4,153,753

SPECTRALLY SELECTIVE SURFACES AND METHOD OF FABRICATING THE SAME

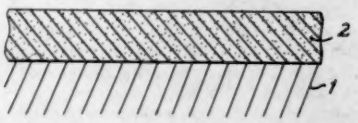
Trevor P. Woodman, Im Breiteli 1, 8117 Fallanden, and Albert Fischer, Grossbuch 14,, 8964 Rudolfstetten, both of Switzerland, assignors to Trevor P. Woodman, Fallanden and Albert Fischer, Rudolfstetten, both of, Switzerland

Filed Aug. 8, 1977, Ser. No. 822,897

Claims priority, application Switzerland, Aug. 20, 1976, 1059676

Int. Cl.² F24J *3/02*; B32B *31/20, 15/16*

U.S. Cl. 428—409 **26 Claims**



1. A body with spectrally selective surface possessing the absorptivity for solar radiation of a correspondingly colored non-selective surface but having a significantly lower emissivity for heat radiation than said non-selective surface, comprising an outer layer comprising at least one metal oxide pigment in powder form selected from the group consisting essentially of oxides of copper, cobalt, iron or mixtures thereof, a supporting substrate having a poorly emitting metal surface selected from the group consisting essentially of copper or aluminum, said outer metal oxide powder layer being mechanically attached to the poorly emitting metal surface of the supporting substrate directly or by means of a binder which is largely transparent to heat radiation emitted from the underlying metal surface, said outer layer possessing a high absorptivity for solar radiation, while being largely transparent to the heat radiation emitted by the surface of the substrate.

14. A process for the fabrication of a body with a spectrally selective surface, comprising the steps of:

providing a substrate having a metal surface selected from the group consisting essentially of copper or aluminum which is to accept a pigment layer;

mechanically attaching an outer layer comprising at least one metal oxide pigment in powder form selected from the group consisting essentially of oxides of copper, cobalt, iron or mixtures thereof to the surface of the substrate; and wherein,

the outer layer possesses a high absorptivity for solar radiation, while being larely transparent to the heat radiation emitted by the surface of the substrate.

4,153,754

MAGNETIC RECORDING MEDIUM IN WHICH AN N-ACYLSARCOSINE DERIVATIVE IS USED AS A DISPERSING AGENT

Hendrikus Huisman, Oosterhout, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,750

Claims priority, application Netherlands, Apr. 18, 1977, 7704183

Int. Cl.² H01F *1/02*

U.S. Cl. 428—539 **7 Claims**

1. A magnetic recording medium comprising a non-magnetic carrier and a magnetizable coating provided on said carrier, said magnetizable coating comprising a binder and magnetic pigments finely dispersed therein by means of a dispersing agent, said dispersing agent being an N-acylsarcosine derivative.

4,153,755

IMPREGNATED SINTERED MATERIAL FOR ELECTRICAL CONTACTS AND METHOD FOR ITS PRODUCTION

Bernhard Rothkegel, and Horst Schreiner, both of Nuremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,340

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709278

Int. Cl.² B22F *3/00*

U.S. Cl. 428—569 **3 Claims**

1. In impregnated sintered material for electrical contact members, comprising a silver and/or copper impregnated skeleton of tungsten, silver and/or copper, and an additive of a wetting promoting metal such as iron, nickel, cobalt, the improvement comprising the material having a carbon content from 2.0 to 7.0 percent by weight, present partly in bound form as tungsten carbide and partly in free form as graphite particles embedded in silver, with the ratio of bound to free carbon at least 1:5 and at most 5:1.

2. In a method for the production of an impregnated sintered material for electrical contact members, comprising a silver and/or copper impregnated skeleton of tungsten, silver and/or copper, and an additive of a wetting promoting metal such as iron, nickel, cobalt, comprising compacting a powder mixture containing tungsten, silver and/or copper, and a wetting promoting metal into a skeleton and subsequently sintering the skeleton and impregnating the skeleton with silver and/or copper, the improvement comprising admixing 2 to 5 percent by weight of graphite to the powder mixture; granulating thermically the mixture obtained in a protective gas atmosphere at temperatures between 800° and 1100° C.; and admixing another 1 to 6 percent by weight of graphite powder relative to the powder mixture to the granules prior to the compaction.

4,153,756

ALUMINUM-BASE BEARING ALLOY AND COMPOSITE

Keiichi Iwahana; Yoshimi Mathuda, and Kenichiro Futamura, all of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

Filed Jan. 6, 1978, Ser. No. 867,316

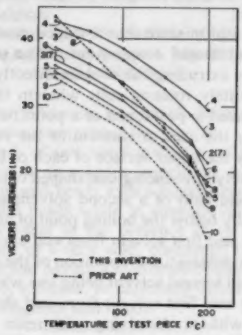
Claims priority, application Japan, Jan. 13, 1977, 52-2690; Jun. 20, 1977, 52-73145

Int. Cl.² B32B *15/04*

U.S. Cl. 428—653 **12 Claims**

1. An aluminum base bearing alloy consisting essentially of

10–30 wt.% of tin, 0.1–1.0 wt.% of chromium and the remainder of aluminum.



4. An aluminum-base alloy bearing material which is made by applying the aluminum-base bearing alloy claimed in claim 1 to a backing steel sheet by pressure welding.

4,153,757

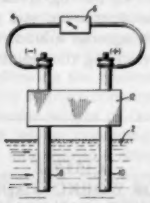
METHOD AND APPARATUS FOR GENERATING ELECTRICITY

William T. Clark, III, 6 Davis Blvd., New Orleans, La. 70121

Continuation of Ser. No. 662,702, Mar. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 143,961, May 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 726,298, May 3, 1968, abandoned. This application Sep. 20, 1977, Ser. No. 835,148

Int. Cl.[2] H01M *2/00*

U.S. Cl. 429—47 **9 Claims**



1. Apparatus for generating electrical current in a load circuit, comprising

a conductive fluid having free electrons therein,

a pair of spaced electrodes disposed in said conductive fluid,

an external load circuit connecting said electrodes, the conductive fluid between said electrodes providing a substantially free path therethrough for said free electrons and said conductive fluid between said electrodes, which flow path is of substantially uniform electrical impedance from one electrode to the other and which liquid and electrodes are characterized by the fact that they maintain in said liquid a substantially constant net free electron concentration in said liquid, and said apparatus being characterized by an ability of one of said electrodes to respond to free electrons more readily than the other in the absence of an essential magnetic field and absent an essential electrochemical change or an essential thermo-electric junction effect which provides current in the load circuit,

and energy source means, other than the relative motion of an essential magnetic field, for exciting said free electrons in said liquid.

4,153,758

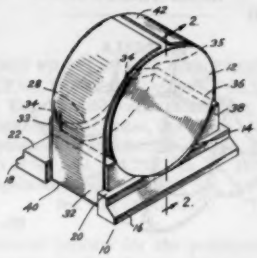
HEARING AID BATTERY HOLDER

Elmer J. Cerny, Des Plaines, Ill., assignor to Beltone Electronics Corporation, Chicago, Ill.

Filed Jun. 15, 1978, Ser. No. 915,888

Int. Cl.[2] H04R *25/00*

U.S. Cl. 429—98 **7 Claims**



1. A single molded plastic battery carrier adapted to be partially inserted into a battery door of a hearing aid comprising;

a bottom support portion;

wall members extending upwardly from the bottom support portion with the wall members defining a cross-section complementary to the opening provided by the battery door and adapted to be inserted into the battery door;

a battery receiving bed above the bottom support portion having a surface adapted to receive a hearing aid battery about less than 50% of the circumference of the battery;

flange handles entending on opposite sides of the bottom support portion adapted to be grasped by the user;

shoulder portions adjacent to said flange handles and terminating at the said walls, the shoulder portions extending outwardly from the said walls whereby the shoulder portions abut the exterior surface adjacent the battery door of the hearing aid; and

means for fastening the battery to the battery carrier;

whereby the size of the battery door need only be slightly larger than the effective cross-section of the battery inserted therethrough.

4. A molded plastic carrier for a cylindrically shaped hearing aid battery, the carrier adapted to be partially inserted into a battery door of a hearing aid, the carrier having:

an arcuate battery receiving bed with a radius of curvature substantially conforming to the radius of curvature of the battery, the arcuate bed extending substantially less than 180 degrees around the battery;

flange handles extending outwardly from opposite sides of the arcuate bed and adapted to be grasped by a user;

shoulder portions on opposite sides of the arcuate bed adapted to abut against the exterior surface of the hearing aid adjacent the battery door;

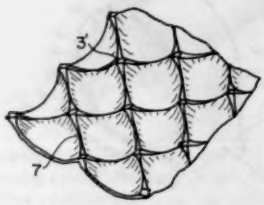
a lip extending radially inward along one curved surface of the arcuate bed so as to uniquely orient the battery in the carrier; and

means for attaching the battery to the carrier.

4,153,759
STORAGE BATTERY, SEPARATOR THEREFOR AND METHOD OF FORMATION

Kazuo Murata; Shiro Tanso, and Junzo Yamao, all of Takatsuki, Japan, assignors to Yuasa Battery Company Limited, Takatsuki, Japan

Continuation of Ser. No. 763,038, Jan. 27, 1977, Pat. No. 4,072,802, which is a continuation-in-part of Ser. No. 592,344, Jul. 1, 1975. This application Feb. 6, 1978, Ser. No. 875,641
Claims priority, application Japan, Jul. 11, 1974, 49-79916
The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.
Int. Cl.[2] H01M *2/18*
U.S. Cl. 429—147 **9 Claims**

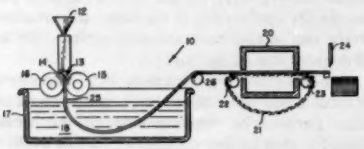


1. A lead-acid storage battery comprising a container, at least one set of battery plates, one plate of the set being a positive plate and another being a negative plate, and a separator interposed between the positive and negative plates, the microporous separator comprising a microporous sheet of heat meltable synthetic resin containing film of less than 0.5 mm in thickness and having submicron micropores, said microporous sheet having a plurality of independent limited embossed parts projecting outwardly from the separator, each of said projecting embossed parts being substantially less than 1 cm^2 in area and the height of the embossed parts being less than 1.5 mm, the number of embossed parts on the sheet being more than 50 per square 100 cm^2 of sheet, the projecting embossed parts being connected substantially with projecting embossed channels which help gas formed in the cell escape upward out of the cell, the height of the projecting embossed channels being lower than the height of said projecting embossed parts, and the pores of said embossed parts being at least partially closed.

4,153,760
MICROPOROUS PLASTIC MEMBER SUCH AS A BATTERY SEPARATOR AND PROCESS FOR MAKING SAME

Erik G. Sundberg, Osbacken, Sweden; George A. Campbell, Newfoundland, N.J., and Edward I. Doucette, Hollywood, Calif., assignors to Aktiebolaget Tudor, Sweden

Continuation of Ser. No. 83,142, Oct. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 661,539, Aug. 18, 1967, abandoned. This application Oct. 15, 1974, Ser. No. 514,628
Claims priority, application Sweden, Sep. 1, 1966, 11747/66
Int. Cl.[2] H01M *2/16*; B29H *7/20*; C04B *33/32*
U.S. Cl. 429—252 **10 Claims**



1. A process for producing a microporous storage battery separator which comprises:

(a) forming a mixture of a vinyl chloride resin, a plasticizing amount of a first solvent and finely divided particles of a filler which contains a volatilizable constituent releasable therefrom by heating and which shrinks substantially and irreversably upon release of said volatilizable constituent therefrom;

(b) forming said mixture into a shaped continuous member without substantial evaporation of the solvent from the mixture by extruding the mixture directly into the nip of two oppositely rotating rolls wherein the outlet of the extruder head is positioned at a point between the plane containing the axes of rotation of the rolls and a plane defined by the upper surface of each of the rolls;

(c) immediately introducing said shaped continuous member into a liquid bath of a second solvent at a temperature substantially below the boiling point of any liquid present to extract said first solvent from said continuous member before any substantial evaporation of the said first solvent occurs, said second solvent being one which is capable of extracting said first solvent from said shaped continuous member without dissolving said resin and said filler, thereby deplasticizing said member by extractively removing said first solvent from said member; and

(d) thereafter heating said member at an elevated temperature but below the softening point of the resin contained therein until said filler is shrunk within the member by release of its volatilizable content.

4,153,761
METHOD OF REMOVING FOULANTS FROM ION EXCHANGE RESINS

Daniel G. Marsh, Monmouth County, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 21, 1978, Ser. No. 899,034
Int. Cl.[2] B01D *15/06*
U.S. Cl. 521—26 **7 Claims**

7. Method of removing photographic waste water foulants from an anion exchange column, said method consisting of adding a three percent aqueous solution of hydrogen peroxide to the column and removing the reaction products from the column.

4,153,762
PROCESS FOR WORKING ADDITIVE INTO POLYMERS, PARTICULARLY POLYMERS WHICH CAN BE FOAMED

Werner Lauterberg, Halle-Neustadt; Herbert Steinmetzer; Brigitte Weber, both of Leuna; Dieter Haack, Geschwenda, and Werner Taube, Halle-Neustadt, all of German Democratic Rep., assignors to VEB Leuna-Werke "Walter Ulbricht", Leuna, German Democratic Rep.

Continuation of Ser. No. 636,399, Dec. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 552,451, Feb. 24, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 839,157
Int. Cl.[2] C08J *9/00*
U.S. Cl. 521—53 **11 Claims**

1. In a process for working solid additives into a thermoplastic polymer wherein a mixture of thermoplastic granulate and said additives are heated to a temperture sufficient for melting said thermoplastic polymer, followed by homogenizing, and extruding the molten mixture; the improvement which comprises first mixing said solid additive with organic polymeric foam plastic flakes having a density up to 0.6 g/cm^3 and 15 to 85% open foam cells to effect adsorption of said additives onto said polymeric flakes, then adding said additives adsorbed on said polymeric flakes to said thermoplastic polymer granulate prior to heating this mixture in order to achieve uniform distribution of said additives in said thermoplastic polymer.

4,153,763

PROCESS FOR PRODUCING EXPANDABLE BEADS OF VINYL AROMATIC POLYMER RESINS

William J. I. Bracke, Hamme, Belgium, assignor to Labofina S. A., Brussels, Belgium

Filed May 18, 1978, Ser. No. 907,333
Claims priority, application Belgium, Sep. 22, 1977, 0181097
Int. Cl.[2] C08V *9/18*
U.S. Cl. 521—60 14 Claims

1. A process for producing expandable beads of vinyl aromatic polymer resins, comprising the steps of:

(a) forming beads of said vinyl aromatic polymer resin by polymerization in an aqueous suspension; and,

(b) impregnating said beads with a liquid blowing agent by contacting said beads while in aqueous suspension with said blowing agent in the presence of an amount of a diethanolamide of a fatty acid, containing from 12 to 20 carbon atoms and having a hydrophilic-lipophilic balance lower than 15, sufficient to uniformly disperse said blowing agent throughout said beads.

4,153,764

PROCESS FOR THE PRODUCTION OF POLYISOCYANATE ORGANIC SILICATE SOLID/CELLULAR SOLID PRODUCT

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, Pat. No. 4,097,424, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,072,637, which is a continuation-in-part of Ser. No. 262,485, Jul. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application May 5, 1978, Ser. No. 896,981
Int. Cl.[2] C08G *18/00*
U.S. Cl. 521—155 32 Claims

1. A process for producing polyisocyanate organic silicate cellular solid products by the following steps:

(a) mixing component (B), an organic polyisocyanate or polyisothiocyanate, with component (A), an oxidated silicon;

(b) agitating the mixture at 20° to 60° C. for 10 to 30 minutes thereby producing a polyisocyanate silicate prepolymer;

(c) admixing component (C), an organic additive, and component (D), a curing agent with the polisocyanate silicate prepolymer, and allowing the resultant mixture to react, wherein said organic additive contains from 1 to 9 carbon atoms, has a molecular weight of from 32 to 400 and is selected from the group consisting of monoalcohols, monothioalcohols, monophenols, monothiophenols, halomethyl group containing compounds, nitriles, esters, ethers, thioethers, ketones, nitro-group containing compounds, monocarboxylic acid chlorides, monocarboxylic acid bromides, monosulphonic acids or salts thereof, monocarboxylic acids or salts thereof, and aldehydes, with the proviso that when said organic additive is a monoalcohol, monothioalcohol, monophenol, monothiophenol or monocarboxylic acid, said mixing of (C) and (D) into (A and B) takes place substantially simultaneously.

4,153,765

CURABLE COMPOSITION CONTAINING EPM OR EPDM INTERPOLYMERS

Thomas C. H. Tsai, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Continuation of Ser. No. 681,433, Apr. 29, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,125
Int. Cl.[2] C08F *8/42*
U.S. Cl. 526—48.1 19 Claims

1. A composition having controlled room temperature cure containing an interpolymer selected from the group consisting of an EPM interpolymer formed by copolymerization in the presence of a Ziegler catalyst of ethylene, a monoolefin containing 3 to 12 carbon atoms, and an unsaturated organo-silane having at least one unsaturated organic group and from 1 to 3 highly hydrolyzable groups other than oxygen containing groups thereby to avoid poisoning the catalyst and maintaining the stability of the polymerization reaction attached to the silicon atom and an EPDM interpolymer of ethylene, a monolefin containing 3 to 12 carbon atoms, a polyene and an unsaturated organosilane of the type described with hydrolyzable groups remaining on the organosilanes bound in the interpolymer replacing the hydrolyzable groups with short chained alkoxy groups at a time when they can no longer interfere with the polymerization reaction, and an organotin carboxylate for controlling room temperature cure of the interpolymer containing the short chained alkoxy groups.

4,153,766

CONTINUOUS PROCESS FOR THE PRODUCTION OF ETHYLENE TEREPHTHALATE POLYESTERS

Tohru Koide, Yao; Tabashi Ezawa, Kashihara; Hideki Onoda; Chiharu Masaki, both of Settsu, and Tohru Morita, Osaka, all of Japan, assignors to Kanebo Ltd., Tokyo, Japan

Continuation of Ser. No. 444,778, Feb. 22, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,199
Int. Cl.[2] C08G *63/22*
U.S. Cl. 526—59 4 Claims

1. A continuous process for the production of ethylene terephthalate polyesters which comprises passing a polyester-forming fusion melt predominantly comprised of bis-2-hydroxethyl terephthalate and/or its low polymers sequentially through a series of reduced pressure polymerization vessles while controlling the degree of polymerization of the product by a controlling system, characterized in that, the viscosity of material leaving each of said vessels except for the first vessel is controlled in cascade by the steps of:

measuring melt viscosities of material entering and leaving a downstream vessel at predetermined time intervals;

storing the values so measured in a memory and calculating a resultant sum wherein said resultant sum is calculated by adding a value which corresponds to a difference between a set point and a measured value for the melt viscosity of the material leaving said downstream vessel at one of said time intervals to a value which corresponds to a difference between a set point and a measured value for the melt viscosity of material entering said downstream vessel at a predetermined time interval prior to said one time interval;

resetting the set point for pressure control of a melt viscosity of the material in said downstream vessel in response to the resultant sum; and

controlling the melt viscosity by adjusting pressure of the preceding upstream vessel by automatically resetting, for the preceding upstream vessel, the set point for a melt viscosity of the material leaving said upstream vessel, when the reset set point for said downstream vessel falls outside a predetermined range.

4,153,767

METHOD OF PRODUCING 1,2-POLYBUTADIENE

Haruo Ueno, Chiba; Kyohei Oizumi, Ichihara; Hideo Ishikawa, Chiba; Kohei Nakajima, Ichihara; Nobuhiro Tsujimoto, Ichihara; Osamu Kimura, Ichihara, and Hideyuki Aikawa, Ichihara, all of Japan, assignors to Ube Industries Limited, Ube, Japan

Filed Nov. 22, 1977, Ser. No. 853,904
Int. Cl.[2] C08F *4/70, 36/06*
U.S. Cl. 526—141 34 Claims

1. A process for producing 1,2-polybutadiene comprising polymerizing 1,3-butadiene in the presence of a catalyst which has been prepared by admixing: (A) a catalyst component solution prepared by dissolving, in an organic solvent containing at least a portion of 1,3-butadiene to be polymerized, (a) at least one cobalt compound which is soluble in said organic

solvent and (b) at least one organoaluminum compound of the formula (1)

$$AlR_3 \quad (1)$$

wherein R represents an aliphatic hydrocarbon radical having 1 to 6 carbon atoms, an alicyclic hydrocarbon radical having 3 to 6 carbon atoms or phenyl radical; (B) N,N-dimethylformamide and; (C) carbon disulfide.

4,153,768

ORGANIC HYDROXY SILICATES UTILIZED AS CURING AGENTS FOR POLYURETHANE PREPOLYMERS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, Pat. No. 4,097,424, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,072,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Nov. 18, 1977, Ser. No. 852,846

Int. Cl.[2] C08G *18/00*

U.S. Cl. 521—155 **21 Claims**

1. The process for curing a liquid isocyanate-terminated polyurethane prepolymer with a mixture of an organic hydroxy silicate compound and polymer to produce a polyurethane product by the following steps:

(a) adding 1 part by weight of a mixture of an organic hydroxy silicate compound and polymer, produced by heating about 1 part by weight of a fine granular hydrated silica with 1 to 3 parts by weight of an organic hydroxy compound in the presence of an alkali catalyst while agitating for 20 to 90 minutes, to up to 1 part by weight of water;

(b) admixing 0.5 to 6 parts by weight of a liquid isocyanate-terminated polyurethane prepolymer to the said mixture;

(c) agitating said mixture for 5 to 15 minutes, thereby

(d) producing a polyurethane product.

4,153,769

VINYL POLYMERIZATION WITH BORON CHELATES AS CATALYST AND PHOTOCONDUCTIVE SENSITIZER

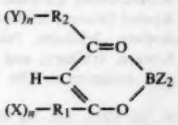
James M. Halm, Lombard, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed Nov. 8, 1976, Ser. No. 739,651

Int. Cl.[2] C08F *4/14, 30/06*

U.S. Cl. 526—195 **11 Claims**

1. A process for polymerizing N-alkenyl carbazoles in the presence of a catalyst to produce organic polymers having sufficiently sensitized photoconductive properties to enable use as an organic photoconductor in the production of photoconductive elements with the catalyst remaining in the polymer comprising heating the carbazole in the presence of a catalyst compound having the general formula



in which X and Y are selected from the group consisting of a halogen, an alkyl or cycloaliphatic group, an aryl or alkaryl group, an alkoxy group and a halogenated methyl derivative, Z is either an aryl group or a halogen group, n is a number from 1 to 5, R_1 and R_2 are selected from the group consisting of an alkyl or cycloaliphatic group, an aryl or alkaryl group, and in which R_2 may be a group having the general formula

in which R_1 has the same meaning as above and p is a number from 1 to 2.

4,153,770

EMULSIFIER FOR EMULSION POLYMERIZATION

Yuzuru Ogata; Takeshi Kawaguchi; Ikuya Kinoshita; Hirokazu Nakayama, and Toshinao Ukena, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1977, Ser. No. 833,680

Claims priority, application Japan, Oct. 1, 1976, 51-118355

Int. Cl.[2] C08F *2/30, 120/12*

U.S. Cl. 526—209 **6 Claims**

1. In a process for preparing vinyl polymers by emulsion polymerization which comprises emulsifying an emulsion-polymerizable vinyl monomer in water and maintaining the emulsion under conditions effective to polymerize the monomer, the improvement which comprises: the emulsion is prepared by using as the emulsifier an effective emulsifying amount of a nonionic surfactant which has been prepared by adding 30 to 100 mols of alkylene oxide having from 2 to 4 carbon atoms to one mol of an aliphatic or alicyclic polyhydric alcohol having from 3 to 10 carbon atoms and from 3 to 10 functional hydroxyl groups to form a first reaction product and then esterifying said first reaction product with a long chain fatty acid to introduce one to 2 mols of an acyl group having from 6 to 22 carbon atoms, said emulsifier having an HLB value of from 17 to 19.

4,153,771

HYDROCARBON RESIN PREPARED FROM ANTIMONY PENTAFLUORIDE OR FERRIC CHLORIDE

Herbert L. Bullard, Norton Village, and Larry D. Roduner, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 541,470, Jan. 15, 1975, abandoned, which is a continuation of Ser. No. 422,119, Dec. 5, 1973, abandoned, which is a continuation of Ser. No. 192,650, Oct. 26, 1971, abandoned. This application Mar. 1, 1976, Ser. No. 662,762

Int. Cl.[2] C08F *4/26*

U.S. Cl. 526—221 **1 Claim**

1. A method of preparing a hydrocarbon derived resin having a structure characterized by a softening point in the range of about 10° C. to about 25° C. and comprising from about 50 to about 75 weight percent units derived from piperylene and correspondingly from about 50 to about 25 weight percent units derived from 2-methyl-2-butene and further characterized by having a viscosity at 25° C. in the range of about 40,000 to about 1,000,000 centipoises, said method consisting essentially of (A) polymerizing a mixture of about 35 to about 65 weight percent piperylene and correspondingly from about 65 to about 35 weight percent 2-methyl-2-butene, at a temperature in the range of about 10° C. to about 40° C. in the presence of ferric chloride and a diluent selected from the group consisting of pentane, hexane, heptane, toluene, benzene and unreacted hydrocarbons from the polymerization mixture.

4,153,772
VULCANIZABLE MOLDING COMPOSITIONS

Helmut Schwesig; Karl-Heinz Nordsiek, and Friedrich-Wilhelm Küpper, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 608,997, Aug. 29, 1975, abandoned. This application May 20, 1977, Ser. No. 798,958

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1974, 2441717

Int. Cl.[2] C08F *132/04*

U.S. Cl. 526—308 **1 Claim**

1. A vulcanizable molding composition prepared by a process for the production of vulcanizable elastomer molding composition with improved rheological properties and capable of being processed by thermoplastic polymer processing techniques, characterized by a compounding ML-4 value determined according to DIN 53,523 of from 5 to 15 and a compounding Defo value determined according to DIN 53,514 of from 150/2 to 400/5, which comprises blending into a molding composition a mixture of

(a) a polymer component consisting of a polyoctenamer in which 50–95% by weight of the macromolecules are cyclic, said polyoctenamer containing 2–30 weight percent thereof of a low molecular weight portion comprising 90–100% by weight cyclic macromolecules having a molecular weight of 220–6000 as determined by gel permeation chromatography, said polyoctenamer having a trans-content of 50–60% and a RSV of 1.0–1.5 dl/g. as measured in a solution of 0.1 g/dl. polymer in decahydronaphthalene at 135° C.; and

(b) polyoctenamer vulcanizing agents and additives.

4,153,773
ISOBUTYLENE CYCLODIOLEFIN COPOLYMERS AND TERPOLYMERS

Donald J. Buckley, Plainfield; Warren A. Thaler, Matawan, both of N.J., and Joseph P. Kennedy, Akron, Ohio, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 631,444, Nov. 13, 1975, Pat. No. 4,031,300, which is a continuation-in-part of Ser. No. 457,109, Apr. 1, 1975, Pat. No. 3,928,297, which is a continuation-in-part of Ser. No. 151,038, Jun. 8, 1971, Pat. No. 3,808,177. This application Jun. 6, 1977, Ser. No. 803,596

Int. Cl.[2] C08F *210/12*

U.S. Cl. 526—308 **36 Claims**

1. A substantially gel free copolymer consisting of a major portion of an isoolefin having about 4 to about 10 carbon atoms and about 8 to about 45 mole % of one cyclic conjugated diene of about 5 to about 9 carbon atoms, wherein said cyclic conjugated diene is selected from the group consisting of cyclopentadiene or methylcyclopentadiene, said copolymer having an Mn of about 30,000 to less than 90,000.

17. A substantially gel free terpolymer consisting of a major portion of an isoolefin having about 4 to about 10 carbon atoms and a minor portion of an acyclic conjugated diene having about 5 to about 9 carbon atoms and a cyclic conjugated diene having about 5 to about 9 carbon atoms, said cyclic conjugated diene selected from the group consisting of cyclopentadiene and methylcyclopentadiene, a mole % unsaturation of said cyclic conjugated diene being at least 20 mole %, an Mn of said terpolymer being about 30,000 to about 50,000.

21. A substantially gel free terpolymer consisting of a major portion of an isoolefin having about 4 to about 10 carbon atoms and a minor portion of an acyclic conjugated diene having about 5 to about 9 carbon atoms and a cyclic conjugated diene having about 5 to about 9 carbon atoms, said cyclic conjugated diene selected from the group consisting of cyclopentadiene and methylcyclopentadiene, a mole % unsaturation of said cyclic conjugated diene being at least 15 mole %, an Mn of said terpolymer being about 50,000 to about 60,000.

29. A substantially gel free terpolymer consisting of a major portion of an isoolefin having about 4 to about 10 carbon atoms and a minor portion of one acyclic conjugated diene having about 5 to about 9 carbon atoms and one cyclic conjugated diene having about 5 to about 9 carbon atoms, said cyclic conjugated diene selected from the group consisting of cyclopentadiene and methylcyclopentadiene, a mole % unsaturation of said cyclic conjugated diene being at least 8 mole %, an Mn of said terpolymer being about 70,000 to less than 90,000.

33. A substantially gel free terpolymer consisting of a major portion of an isoolefin having about 4 to about 10 carbon atoms and a minor portion of an acyclic conjugated diene having about 5 to about 9 carbon atoms and a cyclic conjugated diene having about 5 to about 9 carbon atoms, said cyclic conjugated diene selected from the group consisting of cyclopentadiene and methylcyclopentadiene, a mole % unsaturation of said cyclic conjugated diene being at least about 10 mole%, an Mn of said terpolymer being about 30,000 to less than 90,000.

4,153,774
MANUFACTURE OF HIGH PRESSURE POLYETHYLENE

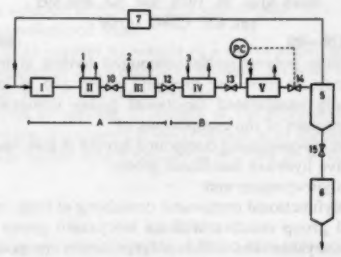
Klaus Boettcher, Wesseling; Heinrich G. Hoerdt, Bruehl; Wieland Zacher, Wesseling, and Oskar Buechner, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 763,138, Jan. 27, 1977, abandoned. This application Nov. 10, 1977, Ser. No. 850,398

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1976, 2606114

Int. Cl.[2] C08F *6/00, 6/26, 10/02*

U.S. Cl. 526—352.2 **4 Claims**



1. A process for the continuous manufacture of an ethylene polymer by homopolymerization of ethylene or copolymerization of ethylene with one or more other monomers copolymerizable with ethylene, in a polymerization zone at from 1,000 to 4,000 bars and from 100° to 450° C., followed by transfer of the reaction mixture through a cooling zone into a high pressure product separation zone where the pressure is from 200 to 350 bars, the pressure prevailing in the cooling zone being lower than in the polymerization zone but being from 50 to 500 bars higher than in the high pressure product separation zone, wherein the pressure in the cooling zone is reduced periodically and recurrently for a duration of from 0.1 to 10 seconds at the outlet from the cooling zone to the high pressure product separation zone, these brief pressure reductions being independent of the pressure reductions to which the reaction mixture is subjected in the polymerization zone.

4,153,775
SELF-CROSSLINKABLE POLYURETHANES

Hans D. Winkelmann; Karlheinz Wolf, both of Cologne; Harald Oertel, Odenthal-Gloebusch, and Norbert Weimann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,504

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707659

Int. Cl.[2] C08G *18/80, 18/32*

U.S. Cl. 528—45 16 Claims

1. A process for the preparation of a solution of a polyurethane which is self-crosslinkable through masked isocyanate groups comprising reacting at least one long chain dihydroxy compound having a molecular weight of substantially 600 to 6000 with an excess of at least one organic diisocyanate in the presence of at least one isocyanate adduct diol having the formula:

M—CO—NH—D'—NH—CO—A,

wherein

M is a diol containing residue derived by reaction of the active N-hydrogen of an aminodiol or a hydrazinodiol which contains a primary or secondary amino group, with an isocyanate group;

D' is the divalent residue of an organic diisocyanate; and

A is an isocyanate masking group,

to form a substantially linear modified isocyanate prepolymer containing from 0.1 to 10% by weight, based on the solids content, of isocyanate adduct diol in combined form; and then reacting the product with a chain lengthening agent in a solvent.

4,153,776
AMIDE-MODIFIED URETHANE ACRYLATE RADIATION CURABLE COMPOUNDS AND COATING COMPOSITIONS AND METHODS OF MAKING SAME

Charles B. Friedlander, Glenshaw; Gerald W. Gruber, Sewickley, and Rostyslaw Dowbenko, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1978, Ser. No. 890,895

Int. Cl.[2] C08G *18/04*

U.S. Cl. 528—49 44 Claims

1. Addition polymerizable compound having at least one amide group, at least one urethane group and at least one ethylenically unsaturated functional group comprising the reaction product of the components of

(a) an amide-containing compound having at least one NCO-reactive hydroxy functional group;

(b) a polyisocyanate; and

(c) a polyfunctional compound containing at least one functional group reactive with an isocyanato group of said polyisocyanate and which polyfunctional compound provides at least one ethylenically unsaturated functional group in said reaction product.

4,153,777
POLYURETHANE AND METHOD OF MAKING

Edwin C. Slagel, Phoenix, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Oct. 1, 1975, Ser. No. 618,653

Int. Cl.[2] C08G *18/12*

U.S. Cl. 528—60 2 Claims

1. A polyurethane comprising the reaction product of an equivalent of a reactive hydrogen containing material of 400 to 6000 molecular weight selected from polyester polyol or polyether polyol with a degassed reaction product of 1.5 to 2.5 equivalents of an organic polyisocyanate and 0.05 to 0.40 equivalents of water cured with about 0.90 to 1.00 equivalents of a polyol having less than 800 molecular weight.

4,153,778
ACRYLYL CAPPED URETHANE OLIGOMERS

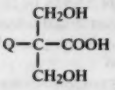
Kisoon Park; George M. Bryant, both of Charleston, and Frazier G. Carr, St. Albans, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,830

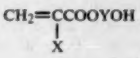
Int. Cl.[2] C08G *18/34*

U.S. Cl. 528—76 5 Claims

1. Acrylyl capped urethane oligomers, said oligomers being the reaction products of (A) a polyoxytetramethylene diol of the formula $HO(CH_2CH_2CH_2CH_2O)_{xx}H$ having a number average molecular weight of from 500 to 10,000 or a polycaprolactone polyol having an average molecular weight of from 290 to about 6,000 and containing from 2 to 6 hydroxyl groups or mixtures thereof, (B) an organic diisocyanate, (C) a di- or tri-methylol carboxylic acid of the formula:



wherein Q is hydrogen, alkyl of from 1 to 8 carbon atoms, or hydroxymethylol and (D) an acrylyl compound of the formula:



wherein X is hydrogen or methyl and Y is a linear or branched alkyl group having from 2 to 5 carbon atoms.

4,153,779
LIQUID CRYSTAL COPOLYESTER CONTAINING A SUBSTITUTED PHENYLHYDROQUINONE

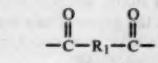
Winston J. Jackson, Jr., Kingsport; Gary G. Gebeau, Johnson City, and Herbert F. Kuhfuss, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

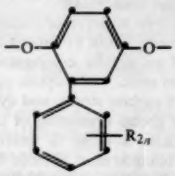
Filed Jun. 26, 1978, Ser. No. 918,861

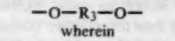
Int. Cl.[2] C08G *63/18, 63/00*

U.S. Cl. 528—176 3 Claims

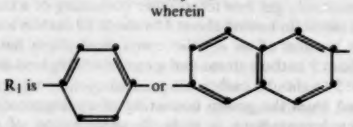
1. A copolyester having a fiber-forming molecular weight consisting essentially of the following divalent radicals


(A)


(B)


(C)

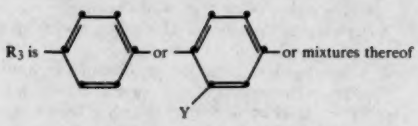
wherein



or mixtures thereof,

R_2 is Cl—, Br— or a monovalent alkyl radical having one to four carbon atoms,

n is 1, 2 or 3,



where Y is Cl—, Br— or a monovalent alkyl radical having one to three carbon atoms,

the range of radical (C) is 0 to 40 mole percent, based on the total moles of radical (B) and radical (C) combined.

4,153,780

PROCESS FOR THE PREPARATION OF POLYCARBONATE WITH WEATHERPROOF PROPERTY

Yoshihiro Narita; Hideo Konuma; Sanae Tagami, and Hirosi Yamada, all of Tokuyama, Japan, assignors to Idemitsu Kosan Company Limited, Japan

Filed Jan. 14, 1974, Ser. No. 436,333

Claims priority, application Japan, Jan. 25, 1973, 48-9855

Int. Cl.[2] C08G *63/62;* C08L *69/00*

U.S. Cl. 528—198 **7 Claims**

1. Process for preparing polycarbonate compositions with excellent weatherproofing properties which comprises adding an ultraviolet absorbing compound having a hydroxy group as at least part of the molecular modifier to an oligomeric polycarbonate which is obtained by the reaction of a dihydroxy compound with phosgene, subsequently condensing said oligomeric polycarbonate to polymerize the same to form a polycarbonate composition, and recovering the so obtained polycarbonate composition with the desired excellent weatherproofing properties, said ultraviolet absorbing compound being a benzotriazole compound.

4,153,781

METHOD OF PRODUCING POLYESTERS

Robert Thillier, Feyzin, and Yves Vaginay, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Continuation of Ser. No. 325,343, Jan. 22, 1973, abandoned. This application Mar. 10, 1978, Ser. No. 885,335

Claims priority, application France, Jan. 24, 1972, 72.02493

Int. Cl.[2] C08G *63/38, 63/34*

U.S. Cl. 528—274 **7 Claims**

1. In a method of making a heat stable polyester containing only ester units of an aromatic dicarboxylic acid and a glycol having from three to ten carbon atoms by transesterification in the presence of an organic titanium compound catalyst between an alkyl ester of an aromatic dicarboxylic acid and a glycol and then polycondensation of the transesterification product, the improvement which comprises conducting the polycondensation in the presence of an organotitanium compound catalyst and from about 0.001% to 1% by weight, based on the weight of the polyester to be produced of a nonvolatile amine having a boiling point above 200° C. and selected from the group consisting of dibenzylamine, dioctylamine, triethanolamine, trioctylamine, tribenzylamine, and benzyldiethanolamine.

4,153,782

DIELECTRIC COATING COMPOSITIONS DERIVED FROM TEREPHTHALIC ACID-1,2-PROPANE DIOL POLYESTERS

Charles H. Coney, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,161

Int. Cl.[2] C08G *63/18*

U.S. Cl. 528—302 **2 Claims**

1. A dielectric film-forming composition comprising a polyester derived from, base on 100 mol percent dicarboxylic acid and 100 mole percent glycol, at least 70 mol percent terephthalic acid or an ester forming derivative thereof, and at least 70 mol percent 1,2-propanediol, said polyester having an inherent viscosity of between about 0.2 and about 0.5.

4,153,783

COPOLYIMIDES

John Gagliani, San Diego, and John V. Long, El Cajon, both of Calif., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 522,765, Nov. 11, 1974, Pat. No. 3,966,652. This application May 27, 1975, Ser. No. 581,137

Int. Cl.[2] C08G *73/10*

U.S. Cl. 528—337 **23 Claims**

12. A copolyimide foam precursor which is a resinoid obtained by combining one or more esters of a tetracarboxylic acid with two or more diamines, one of said diamines being heterocyclic and having nitrogen in the ring, another of said diamines being a para- or meta-substituted aromatic diamine which is free of aliphatic moieties, any additional diamine being either a heterocyclic or an aromatic diamine as aforesaid, and the volatiles content of the resinoid being from one to five percent lower than the theoretical volatiles content of the ester or esters and the diamines.

4,153,784

NYLON COPOLYMER FROM PIPERAZINE, ALIPHATIC DIAMINE AND MIXTURE OF ALIPHATIC DIACIDS

Peter Horn, Hirschberg; Franz Leppmeier, Lugwigshafen; Guenter Eckert, Limburgerhof, and Karl Fischer, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 27, 1977, Ser. No. 810,198

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1976, 2630114

Int. Cl.[2] C08G *69/26*

U.S. Cl. 528—338 **5 Claims**

1. A nylon copolymer having a K value of from 40 to 65 measured by the method of H. Fikentscher at 20° C. in 1% strength solution in 96% strength sulfuric acid, said copolymer being manufactured from

(a) 5 to 15 percent by weight of a salt of adipic acid and an aliphatic or cycloaliphatic primary diamine containing from 5 to 20 carbon atoms and

(b) 95 to 85 percent by weight of the piperazine salt of a mixture of decane-1,10-dicarboxylic acid and azelaic acid in the molar ratio respectively of from 70:30 to 95:5.

4,153,785

POLYAMIDE RESINS FROM DILACTONES

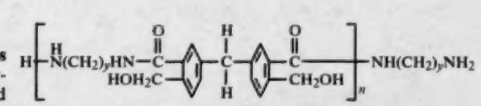
Johann G. D. Schulz, Pittsburgh; Anatoli Onopchenko, Monroeville, and Edward T. Sabourin, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 748,686, Dec. 8, 1976, Pat. No. 4,104,281. This application Apr. 19, 1978, Ser. No. 897,682

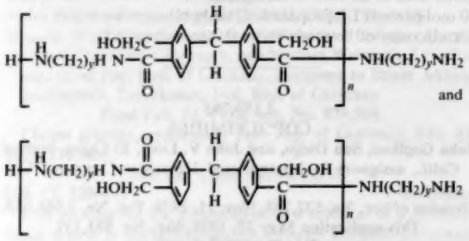
Int. Cl.[2] C08G *69/26*

U.S. Cl. 528—347 **12 Claims**

1. A poly-N-omega-aminoalkyl[methylene-bis-(2-hydroxymethylbenzamide)] resin selected from the group consisting of



-continued



and

wherein y is an integer ranging from about 2 to about 12, and n is an integer ranging from about 20 to about 100.

4,153,786

METHOD FOR PREPARING ESTER END-CAPPED COPOLYETHER GLYCOLS

Gerfried Pruckmayr, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 782,736, Mar. 30, 1977, abandoned. This application May 26, 1978, Ser. No. 910,128

Int. Cl.[2] C08G 65/20

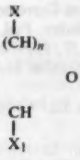
U.S. Cl. 528—408 **8 Claims**

1. A process for preparing ester end-capped copolyether glycol, the process comprising

(A) bringing together, under conditions suitable for reaction,

(1) tetrahydrofuran;

(2) an alkylene oxide containing 2 or 3 carbon atoms in its ring, or a cyclic acetal represented by the structure



where

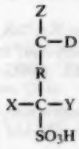
n is 2–4 and

X and X_1 are hydrogen or an alkyl radical of 1–4 carbon atoms;

(3) an acylium ion precursor; and

(4) as a catalyst, a homopolymer of an ethylenically unsaturated monomer (a) containing groups such that the final polymer will contain groups of the formula

or



where represents the polymer chain or a segment thereof;

D is hydrogen, an aliphatic or aromatic hydrocarbon radical of 1–10 carbon atoms, halogen or a segment of the polymer chain;

X and Y are hydrogen, halogen or an aliphatic or aromatic hydrocarbon radical of 1–10 carbon atoms, but at least one of X or Y must be fluorine;

R is a linear or branched linking group having up to 40 carbon atoms in the principal chain; and

Z is hydrogen, halogen or an aliphatic or aromatic hydrocarbon radical of 1–10 carbon atoms;

or a copolymer of monomer (a) with at least one other copolymerizable ethylenically unsaturated monomer (b), the homopolymer or copolymer having an equivalent weight of 950–1500 and a solubility such that no more than about 5%, by weight, dissolves in the reaction medium at the reaction temperature, and then

(B) separating the resulting ester end-capped copolyether glycol from the reaction mass.

4,153,787

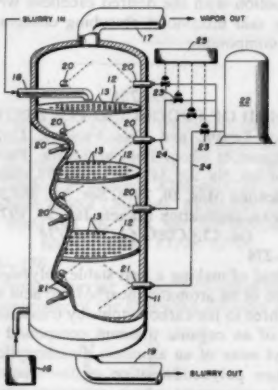
METHOD FOR REMOVING UNREACTED MONOMERS FROM A SLURRY

Dudley W. Cheape, Jr., Decatur, and Charles E. Bankston, Trinity, both of Ala., assignors to Monsanto Company, Decatur, Ala.

Filed Mar. 23, 1978, Ser. No. 889,170

Int. Cl.[2] C08F 6/00

U.S. Cl. 528—500 **4 Claims**



1. In a process wherein an acrylonitrile polymerization slurry made up of 8 to 22 weight percent polymer solids, 3 to 10 weight percent unreacted mono-olefinic monomers and 89 to 68 weight percent water is passed downward through a column containing a plurality of perforated trays and steam is passed upward through the trays in a direction countercurrent to the direction of slurry flow for the purpose of removing unreacted monomers from the slurry, the improvement comprising:

a. sequentially applying sprays of water to that portion of the inner wall of the column above each of said trays, each said portion being sprayed by at least two sprays positioned to substantially cover said portion with said water spray, the total amount of water sprayed being 10–30 percent of the slurry weight.

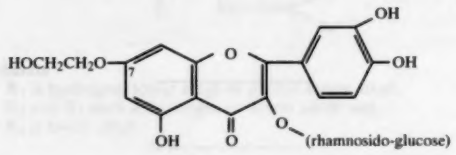
b. operating the sprays intermittently in such a sequence that only one of said two sprays is in operation at a given time and that all sprays are operated within a period of less than about 15 minutes.

4,153,788
PROCESS OF PREPARING MONO-O-β-HYDROXYETHYL-7 RUTOSIDE

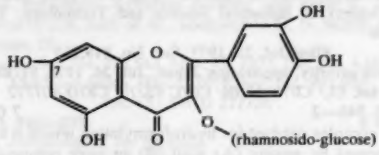
Pierre Courbat, Nyon, and Alban Albert, Avuilly, both of Switzerland, assignors to ZYMA S.A., Nyon, Switzerland

Continuation-in-part of Ser. No. 561,434, Mar. 24, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,201
Claims priority, application Switzerland, Apr. 9, 1974, 4959/74
Int. Cl.[2] C07H *23/00*
U.S. Cl. 536—8 7 Claims

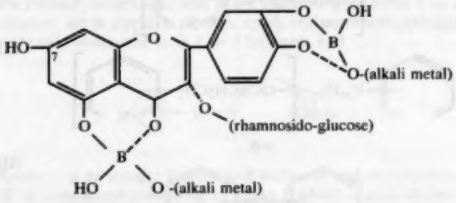
1. A process for preparing mono-O-β-hydroxyethyl rutoside of the formula:



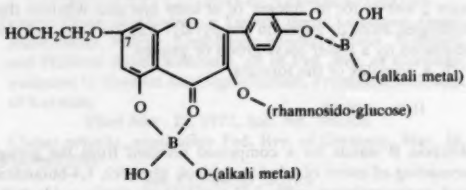
which comprises contacting rutoside of the formula:



in a solvent which is an at least partially aqueous medium with a boric acid alkali salt in an amount substantially not exceeding the amount necessary to form a boron complex of formula:



reacting said boron complex with ethylene oxide to form a hydroxyethoxy compound of the formula



and treating said hydroxyethoxy compound in an at least partially aqueous acid medium, whereby there is produced said mono-O-β-hydroxyethyl-7-rutoside.

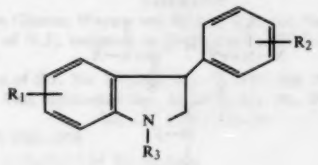
4,153,789
PHENYLINDOLINES

Rudolf Kubela, Cote St. Luc; Vaclav Musil, and Lise A. Hughes, both of Ville-de-Lery, all of Canada, assignors to Delmar Chemicals Limited, Ville La Salle, Canada

Division of Ser. No. 589,402, Jun. 23, 1975, Pat. No. 4,080,330. This application Mar. 20, 1978, Ser. No. 888,133
Int. Cl.[2] C07D *413/06*
U.S. Cl. 544—143 19 Claims

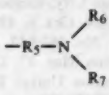
1. A 3-phenylindoline of the formula I:

I



wherein R_1 and R_2 individually represents hydrogen, halogen, lower alkoxy or lower alkyl; R_1 being in the 5-, 6-, or 7-position only; R_3 represents a moiety of formula

wherein R_4 is aminoalkyl of formula



wherein R_5 is a straight or branched chain lower alkyl group; and R_6 and R_7 together with the nitrogen and, optionally an oxygen or further nitrogen, represent morpholino, piperazinyl, piperidinyl, pyrrolidinyl or piperazinyl substituted on the 4-nitrogen with lower alkyl; or a pharmaceutically acceptable addition salt thereof obtained from an inorganic or organic acid.

4,153,790
4-BENZYLOXY-3-(BENZYLOXY CARBONYL)PHENYLTHIOACETMORPHOLIDE

Arthur R. McFadden, East Brunswick; Richard C. Allen, Flemington, and Thomas B. K. Lee, Whitehouse Station, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 843,482, Oct. 19, 1977, Pat. No. 4,118,401. This application Sep. 5, 1978, Ser. No. 939,177
Int. Cl.[2] C07D *295/18*
U.S. Cl. 544—161 1 Claim

1. 4- benzyloxy-3-(benzyloxycarbonyl)phenylthioacetmorpholide.

4,153,791
3-CARBOXY-4 HYDROXYPHENYLTHIOACETMORPHOLIDE

Arthur R. McFadden, East Brunswick; Richard C. Allen, Flemington, and Thomas B. K. Lee, Whitehouse Station, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 843,482, Oct. 19, 1977, Pat. No. 4,118,401. This application Sep. 5, 1978, Ser. No. 939,267
Int. Cl.[2] C07D *295/18*
U.S. Cl. 544—161 1 Claim

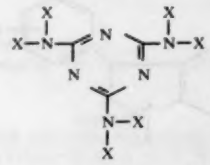
1. 3-carboxy-4-hydroxyphenylthioacetmorpholide.

4,153,792
MELAMINE MOLYBDATE

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 770,168, Feb. 14, 1977, Pat. No. 4,053,455. This application Apr. 29, 1977, Ser. No. 792,293
Int. Cl.[2] C07D *251/70*
U.S. Cl. 544—181 5 Claims

1. A heterocyclic amine molybdate wherein the heterocyclic amine used in producing the molybdate is melamine or a substituted melamine having the formula



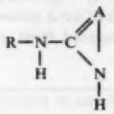
X being hydrogen or an alkyl, alicyclic, aralkyl, alkaryl or aryl group containing from 1 to 10 carbon atoms.

4,153,793
IMIDAZO ALKYLAMINO PYRIMIDONES

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 619,724, Oct. 6, 1975, Pat. No. 4,035,374, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Mar. 17, 1977, Ser. No. 778,812
Claims priority, application United Kingdom, May 3, 1973, 21063/73; Jul. 26, 1973, 35551/73
Int. Cl.[2] C07D *239/42*
U.S. Cl. 544—320 7 Claims

1. A compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms a pyrimidine ring, said ring having a keto or thione group and optionally substituted on a carbon atom by one lower alkyl, phenyl or benzyl group and optionally by one additional lower alkyl group; R is a grouping of the formula:

$$Het—CH_2Z(CH_2)_n—$$

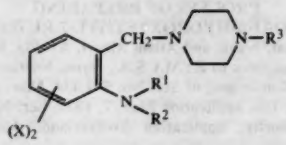
wherein Het is an imidazole ring which is attached at a ring carbon and which is optionally substituted by one lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and n is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

4,153,794
N-BENZYLPIPERAZINES

Toshihiro Ishiguro, and Yasushi Sanno, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 793,356, May 3, 1977, Pat. No. 4,091,220, which is a continuation-in-part of Ser. No. 633,546, Nov. 19, 1975, abandoned. This application Mar. 1, 1978, Ser. No. 882,891
Claims priority, application Japan, Nov. 19, 1974, 49-133281
Int. Cl.[2] C07D *295/16*
U.S. Cl. 544—358 5 Claims

1. A compound of the formula



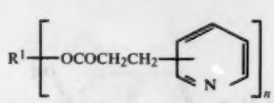
wherein R^1 and R^2 are the same or different and each stands for a hydrogen atom, alkylcarbonyl, whose alkyl moiety is of 1 to 3 carbon atoms, or benzoyl; R^3 stands for alkylcarbonyl, whose alkyl moiety is of 1 to 3 carbon atoms, which is substituted by mercapto, and X stands for a halogen atom, and a pharmaceutically acceptable acid addition salt thereof.

4,153,795
COBALT PYRIDYL CATALYSTS FOR HYDROFORMYLATION

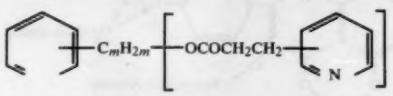
Akio Matsuda, Kashiwa, Japan, assignor to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jul. 22, 1977, Ser. No. 818,253
Claims priority, application Japan, Jul. 26, 1976, 51/88240
Int. Cl.[2] C07F *15/06*; C07C *45/10*; C07D *401/12*
U.S. Cl. 546—2 7 Claims

1. A complex catalyst for hydroformylation which is a complex formed by mixing (A) with (B) an ester compound or ether compound having at least two pyridyl groups in the molecule thereof and selected from the group consisting of compounds of the formulas:

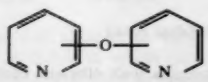


(I),



(II)

and



(III)

wherein R^1 stands for a residue of an aliphatic polyhydric alcohol with 2–20 carbon atoms, n for a valence of said residue of said aliphatic polyhydric alcohol and for an integer of at least 2 and m for an integer of at least one and wherein the hydrogen atom or atoms in the pyridyl ring or rings may be displaced by a lower alkyl group or groups.

7. A complex of the formula:

$$H_2Co_3(CO)_9(B)_a$$

wherein B stands for a compound selected from the group consisting of esters of ethylene glycol, glycerol, 1,4-butandiol and pentaerythritol with 3-(2-pyridyl)-propionic acid; 2-(2-pyridyl)-ethyl 3-(2-pyridyl)-propionate, 3-(2pyridyl)-ethyl 3-(2-pyridyl)-propionates; and di-(2-pyridyl) ether, and a for an positive number from 1.25–5.0.

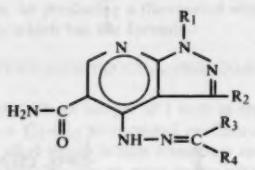
4,153,796

HYDRAZINO DERIVATIVES OF 1H-PYRAZOLO(3,4-B)-PYRIDINE-5-CARBOXAMIDES

Hans Hoehn, Tegernheim, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 10, 1978, Ser. No. 923,128
Int. Cl.[2] C07D *471/04*
U.S. Cl. 546—120 8 Claims

1. A compound of the formula



wherein
R_1 is hydrogen, lower alkyl or phenyl-lower alkyl;
R_2 and R_3 each is hydrogen or lower alkyl; and
R_4 is lower alkyl.

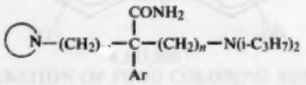
4,153,797

α-ARYL-α, α-BIS[ω- (DISUBSTITUTED AMINO)ALKYL]ACETAMIDES AND RELATED COMPOUNDS

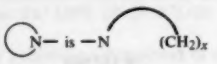
Jerry J. Renbarger, Arlington Heights, and Peter K. Yonan, Morton Grove, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 776,563, Mar. 11, 1977, Pat. No. 4,107,205.
This application May 1, 1978, Ser. No. 901,949
Int. Cl.[2] C07D *211/26*
U.S. Cl. 546—237 6 Claims

1. A compound of the formula



and the non-toxic pharmacologically acceptable acid addition salts thereof; wherein m and n are each integers from 2 to 4 inclusive; Ar is pyridyl, phenyl, tolyl, trifluoromethylphenyl or phenyl substituted with 1 or 2 halogen; and



wherein x is an integer from 4 to 6 inclusive and morpholino.

6. A compound according to claim 1 which is α-(o-chlorophenyl)-α-[2-(diisopropylamino)ethyl]-α-(2-piperidinoethyl) acetamide.

4,153,798

PROCESS FOR THE MANUFACTURE OF 5-ACETOACETYLAMINO-BENZIMIDAZOLONE

Hartmut Heise, Bad Soden am Taunus; Bernd Leibmann, Darmstadt; Dieter, Mörler, Liederbach; Eberhard Ritter, Walldorf, and Wilfried Sahm, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 22, 1977, Ser. No. 780,221
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612391
Int. Cl.[2] C07D *235/26*
U.S. Cl. 548—305 8 Claims

1. In a process for the production of 5-acetoacetylaminobenzimidazolone-(2) by reacting 5-amino-benzimidazolone-(2) with an excess of diketene in water the improvement comprising reacting continuously an aqueous solution consisting essentially of of 5-aminobenzimidazolone-(2) or of a salt thereof with the diketene at a temperature of 30° to 100° C.

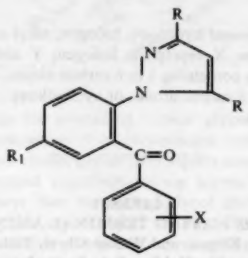
4,153,799

PYRAZOL-1-YL BENZODIAZEPINES AND OXIMES THEREOF

Norman Gilman, Wayne, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 775,346, Mar. 7, 1977, Pat. No. 4,130,716.
This application Sep. 14, 1978, Ser. No. 942,210
Int. Cl.[2] C07D *231/14*
U.S. Cl. 548—378 4 Claims

1. A compound of the formula



wherein X is hydrogen or halogen, R_1 is nitro, amino, hydrogen or halogen, and R is selected from the group consisting of CO_2R_5 and CH_2OR_6 wherein R_5 is lower alkyl and R_6 is acetyl.

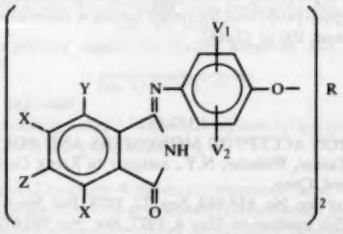
4,153,800

ISOINDOLINONE PIGMENTS

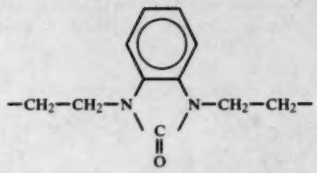
Ernst Model, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 657,010, Feb. 10, 1976, Pat. No. 4,070,367. This application Nov. 10, 1977, Ser. No. 850,443
Claims priority, application Switzerland, Feb. 20, 1975, 2156/75
The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.
Int. Cl.[2] C07D *403/14*
U.S. Cl. 548—305 3 Claims

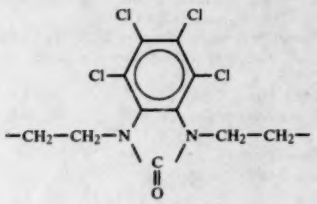
1. An isoindolinone pigment of the formula



wherein R is a heterocyclic radical selected from the group consisting of



and



V_1 and V_2 represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms; X represents halogen; Y and Z represent halogen, alkoxy containing 1 to 6 carbon atoms, alkylmercapto containing 1 to 6 carbon atoms, or cycloalkoxy containing 5 or 6 carbon atoms.

4,153,801

POLYETHERS HAVING TERMINAL AMINO GROUPS

Oskar Schmidt, Kittsee, and Walter Sibral, Tulln, both of Austria, assignors to Lim Holding, S.A., Luxembourg, Luxembourg

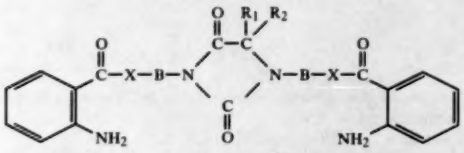
Filed Oct. 26, 1976, Ser. No. 735,281

Claims priority, application Austria, Oct. 27, 1975, 8149/75; Oct. 27, 1975, 8152/75; Oct. 27, 1975, 8153/75; Oct. 27, 1975, 8154/75

Int. Cl.[2] C07D *233/54*

U.S. Cl. 548—312 **11 Claims**

1. An imidazolidinedione compound of the formula



wherein:

R_1 and R_2 independently of one another represent hydrogen or methyl;

—X— is —O— or —S—;

—B— is bivalent polyalkylene ether or polyalkylenethio ether and said polyalkylene is a member selected from the group consisting of polyethylene, polypropylene, polybutylene, poly(ethylene-propylene), poly(ethylene-butylene) and poly(propylene-butylene) having a molecular weight of about 100 to 15,000.

4,153,802

ELECTRON ACCEPTOR MONOMERS AND POLYMERS

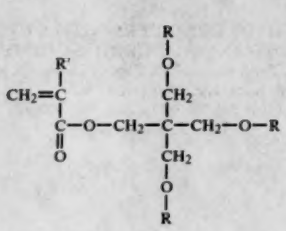
Sam R. Turner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 615,664, Sep. 22, 1975, Pat. No. 4,050,934. This application May 4, 1977, Ser. No. 793,672

Int. Cl.[2] C07C *69/95, 121/66, 69/54*

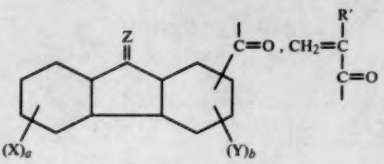
U.S. Cl. 560—21 **1 Claim**

1. Monomers of the formula



wherein

R is

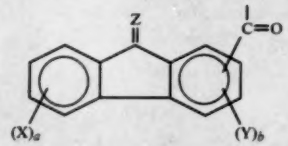


or —H

R′ is hydrogen or methyl;

X and Y are independently selected from the group consisting of $—NO_2$, halogen and $—CF_3$; and

a and b may be from 0 to 3 with the proviso that at least one of R is



4,153,803

CHOLESTEROL-LOWERING PHENOXYALKANOIC ACID ESTERS

Kurt Thiele, Zofingen; Quazi Ahmed, Strengelbach; Rudolf Adrian, Vordemwald, and Ulrich Jahn, Zofingen, all of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

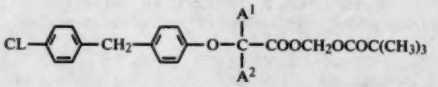
Continuation-in-part of Ser. No. 536,120, Dec. 24, 1974, abandoned. This application Mar. 1, 1977, Ser. No. 773,144

Claims priority, application Switzerland, Dec. 27, 1973, 18144/73; Mar. 28, 1974, 4355/74; Nov. 18, 1974, 15329/74; Nov. 18, 1974, 15330/74

Int. Cl.[2] C07C *69/76*

U.S. Cl. 560—57 **5 Claims**

1. A compound of the formula



wherein A^1 and A^2 are individually selected from the group consisting of hydrogen and C_1–C_4 alkyl.

4,153,804

PROCESS FOR PRODUCING FLUORINATED VINYL ETHER HAVING ESTER GROUP

Masaaki Yamabe, Machida; Seiji Munekata, Yokohama, and Shunichi Samejima, Tokyo, all of Japan, assignors to Asahi Glass Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 765,609, Feb. 4, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,637

Int. Cl.[2] C07C *69/65*

U.S. Cl. 560—183 8 Claims

1. A process for producing a fluorinated vinyl ether having an ester group which has the formula

$$CF_2{=}CFOCF_2(CF(CF_3)OCF_2)_{n\text{-}1}(Rf)_mCO_2R$$

wherein n represents an integer of 1 to 5, m represents 0 or 1; Rf represents a C_1–C_{10} bifunctional perfluoro group and R represents an alkyl group which comprises reacting a fluorinated acyl fluoride having an ester group which has the formula

$$FOC(CF(CF_3)OCF_2)_n(Rf)_mCO_2R$$

with an alkali metal carbonate to produce an alkali metal salt of fluorinated carboxylic acid having an ester group which has the formula

$$MOOC(CF(CF_3)OCF_2)_n(Rf)_mCO_2R$$

wherein M represents an alkali metal, and then, pyrolyzing the alkali metal salt of fluorinated carboxylic acid having an ester group.

4,153,805

PREPARATION OF FOOD COLORING AGENTS

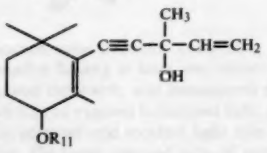
Michael Rosenberger, Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 791,662, Apr. 28, 1977, abandoned, which is a division of Ser. No. 723,441, Sep. 15, 1976, Pat. No. 4,045,476, which is a division of Ser. No. 585,224, Jun. 9, 1975, Pat. No. 4,000,198. This application Sep. 29, 1977, Ser. No. 837,774

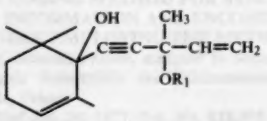
Int. Cl.[2] C07C *67/24, 175/00*

U.S. Cl. 560—240 2 Claims

1. A process for preparing a compound of the formula:



wherein R_{11} is lower alkanoyl;
comprising treating a compound of the formula:



wherein R_1 taken together with its attached oxygen moiety forms an ether protecting group removable by hydrolysis; with a lower alkanoic acid.

4,153,806

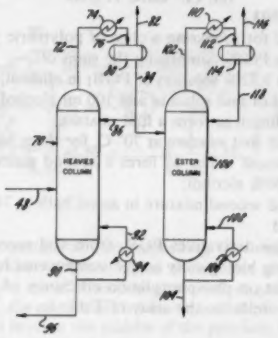
RECOVERY OF VICINAL GLYCOL ESTERS BY PLURAL STAGE DISTILLATION

Alan Peltzman, Jamaica, N.Y., assignor to Halcon Research and Development Corp., New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,082

Int. Cl.[2] C07C *67/06*

U.S. Cl. 560—246 16 Claims



1. A process for producing vicinal glycol esters having reduced concentrations of organo-halogen compound impurities from impure vicinal glycol ester liquids containing organo-halogen compound impurities having normal boiling points higher and lower than the vicinal glycol esters which comprises distilling the impure liquid in a first distillation zone to form a first bottoms product comprising higher-boiling organo-halogens and a first overhead product comprising vicinal glycol esters and lower-boiling organo-halogens, and distilling at least a portion of the first overhead product in a second distillation zone to form a second overhead product comprising lower-boiling organo-halogens and a second bottoms product comprising vicinal glycol esters containing the reduced concentrations of organo-halogen compound impurities.

4,153,807

PHENYLALKANOIC ACIDS

Stewart S. Adams; Bernard J. Armitage, and John S. Nicholson, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

Continuation-in-part of Ser. No. 656,220, Feb. 9, 1976, Pat. No. 4,048,352, which is a continuation-in-part of Ser. No. 367,614, Jun. 6, 1973, Pat. No. 3,769,402. This application Jun. 20, 1977, Ser. No. 808,007

Claims priority, application United Kingdom, Jun. 15, 1972, 28104/72

Int. Cl.[2] C07C *65/14*

U.S. Cl. 562—469 6 Claims

1. A 2-(halogenated-2-hydroxy-4-biphenylyl)propionic acid selected from the group consisting of:

2-(4'-chloro-2-hydroxy-4-biphenylyl)propionic acid
2-(2',4'-difluoro-2-hydroxy-4-biphenylyl)propionic acid
2-(2'-chloro-4'-fluoro-2-hydroxy-4-biphenylyl)propionic acid
2-(4'-fluoro-2-hydroxy-4-biphenylyl)propionic acid and
2-(2'-fluoro-2-hydroxy-4-biphenylyl)propionic acid.

4,153,808

NOVEL PROSTAGLANDIN DERIVATIVES, CERTAIN IN VIVO AND IN VITRO EFFECTS THEREOF AND PROCESSES FOR THE PREPARATION OF SAME

B. David Polis, and Edith Polis, both of 8519 Patten Rd., Wyndmoor, Pa. 19118

Continuation of Ser. No. 429,306, Dec. 28, 1973, abandoned. This application Nov. 28, 1975, Ser. No. 635,947

Int. Cl.[2] C07C *177/00*

U.S. Cl. 562—503 12 Claims

1. A method for preparing a class of polymeric prostaglandin derivatives PGB_x comprising the steps of:

combining a 3.72% solution of PGB_1 in ethanol, 24 g KOH per 100 ml of said solution and 100 ml alcohol per 100 ml of said solution to form a first mixture;

refluxing said first mixture at 70° C. for three hours;

adding sufficient water to form a second mixture of 1 N KOH in 50% alcohol;

refluxing said second mixture in an oil bath at 74° C. for 19 hours; and

separating the derivatives PGB_x from said second mixture for yielding biologically active components having an in vitro effect on phosphorylation efficiency of aged mitochondria similar to the assay of Table I.

4,153,809

EXTRACTIVE SEPARATION OF GLYCOLIC ACID FROM DIGLYCOLIC ACID

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 11, 1977, Ser. No. 823,577

Int. Cl.[2] C07C *59/23, 59/06*

U.S. Cl. 562—583 10 Claims

1. A process for separating an aqueous solution of glycolic acid and diglycolic acid into component parts which comprises: (1) contacting the solution with an extractant comprising a trihydrocarbylphosphine oxide and a water insoluble organic liquid solvent, to form an organic phase rich in diglycolic acid and an aqueous phase rich in glycolic acid, and (2) separating the phases formed in step (1).

4,153,810

PROCESS FOR THE PREPARATION OF ALKYL ETHERS

Rainer Neumann, Krefeld; Hans-Helmut Schwarz, Krefeld-Traar, and Karl-Heinz Arnold, Cologne, all of Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

Filed Nov. 18, 1977, Ser. No. 852,754

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655826

Int. Cl.[2] C07C *41/10*

U.S. Cl. 568—630 6 Claims

1. In the known process for the preparation of alkyl aryl ethers by reacting aromatic hydroxy compounds with aliphatic alcohols in the presence of strongly acidic cation exchangers based on synthetic resins the improvement comprising using at least 3 moles of aromatic hydroxy compound per mol of aliphatic alcohol.

4,153,811

HYDROXY ALKENYL NORBORNANE DERIVATIVES

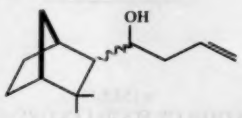
Kenneth K. Light, Long Branch; James M. Sanders, Eatontown; Manfred H. Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853. This application Dec. 13, 1977, Ser. No. 860,142

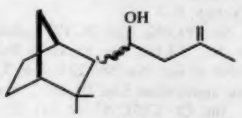
Int. Cl.[2] C07C *33/02, 33/05*

U.S. Cl. 568—820 3 Claims

1. A hydroxy alkenyl norbornane derivative having a structure selected from the group consisting of:



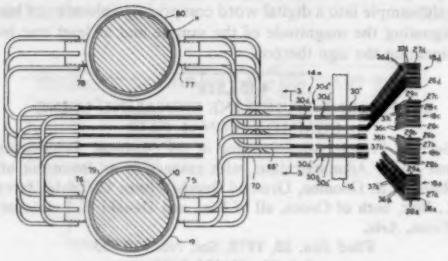
and



4,153,812
BUS BAR ASSEMBLY

John A. Persson, Gibsonia, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1977, Ser. No. 844,210
Int. Cl.[2] H05B 7/11
U.S. Cl. 13—12 9 Claims



1. A bus bar system for connecting a transformer to the electrodes of an electric arc furnace,

bus bar means comprising a plurality of hollow members each having a transverse cross-section whose height is substantially greater than its width,

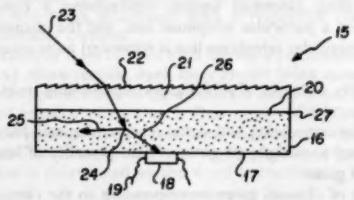
said bus members being arranged in pairs,

a generally planar surface formed on each member and having a dimension substantially equal to the height of said members, the generally planar surfaces on the members of each pair being disposed in an opposed generally parallel relation, and in relatively close proximity, and an insulating material disposed between said surfaces.

4,153,813
LUMINESCENT SOLAR COLLECTOR

Harry R. Blieden, Los Angeles, Calif., and Richard C. Sill, Reno, Nev., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 19, 1978, Ser. No. 916,447
Int. Cl.[2] H01L 31/04
U.S. Cl. 136—89 PC 4 Claims



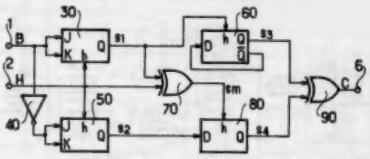
1. A luminescent solar collector comprising at least one luminescent member having at least one photovoltaic means operably associated therewith, said luminescent member having a side which is to be exposed to incident light, a transparent member carried adjacent said incident light side of said luminescent member, the outer exposed side of said transparent member having a roughened surface.

4,153,814
TRANSITION CODING METHOD FOR SYNCHRONOUS BINARY INFORMATION AND ENCODER AND DECODER EMPLOYING THE METHOD

Albert Burgert, Arcueil, France, assignor to Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jul. 26, 1977, Ser. No. 818,998
Claims priority, application France, Aug. 4, 1976, 76 23809
Int. Cl.[2] H04L 27/00
U.S. Cl. 178—68 11 Claims

1. A method of coding synchronous binary data timed by a frequency F, in which said data are coded by level transitions produced in an electrical signal exhibiting two levels under the control of a clock signal defining a bit-time of duration 1/F for each binary digit, wherein the method comprises producing a transition in said two-level signal in the middle of each bit-time occupied by a bit of a first given value, and inhibiting such transitions in the two-level signal if said signal has changed

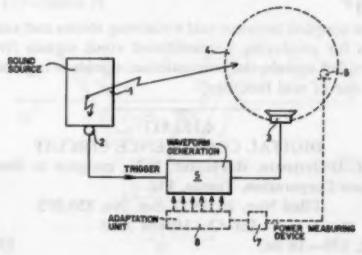


level in the middle of the preceeding bit-time; producing a transition in the two-level signal at the start of each bit-time occupied by a bit of a second given value, and shifting said transition to the middle of that bit-time, if the two-level signal has changed level in the middle of the previous bit, and maintaining the level of said two-level signal constant during the remainder of the time.

4,153,815
ACTIVE ATTENUATION OF RECURRING SOUNDS

George B. B. Chaplin; Roderick A. Smith, both of Colchester, and Robert G. Bearcroft, Ipswich, all of England, assignors to Sound Attenuators Limited, Colchester, England

Filed May 3, 1977, Ser. No. 793,275
Claims priority, application United Kingdom, May 13, 1976, 19717/76
Int. Cl.[2] H04B 15/00; G10L 1/00
U.S. Cl. 179—1 P 5 Claims



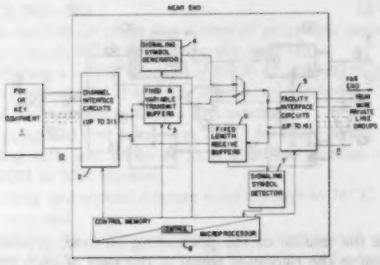
1. A method of reducing the amplitude of sound vibrations received at a selected location from a source of recurring noise, which method comprises the steps of: synchronizing by a timing signal from the source at said location a waveform generator and feeding to said location a secondary sound vibration derived from an output waveform which at least partially nulls the sound vibrations at said location; thereafter storing in a memory component part waveforms of said output waveform and sequentially combining a series of said component part waveforms to modify the output waveform by a successive series of approximations while comparing the degree of cancellation of the unwanted sound vibration from the source at the selected location, each successive approximation being made by altering at least one of the individual component parts and adapting an alternation of a component part by updating that part in the memory or rejecting that part alternation on the basis of whether or not that part alternation improved the degree of cancellation of the unwanted sound vibration.

4,153,816

TIME ASSIGNMENT SPEECH INTERPOLATION COMMUNICATION SYSTEM WITH VARIABLE DELAYS

Willam A. Morgan, Longmont, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Dec. 23, 1977, Ser. No. 863,902
Int. Cl.[2] H04J *5/00*
U.S. Cl. 179—15 AS **17 Claims**



1. A communication system of the type having a means for dispatching original signals from a plurality of input channels through switching means to a lesser plurality of transmission facilities connected to a remote location, said system comprising:

a speech detector coupled to each input channel for detecting the presence of said signals on that channel;

means for sampling the detected signals from each of said input channels;

a variable length speech buffer for temporarily storing the sampled signals if a facility is unavailable until one such facility is available;

control means responsive to said speech detector for assigning the sampled speech signals from each input channel to available transmission facilities through said switching means, for assigning said signals to said buffer if no facility is available and for sequentially retrieving said sampled signals from said buffer when a facility becomes available; and

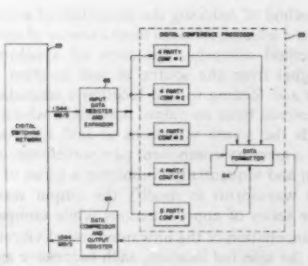
means coupled between said switching means and said facilities for producing reconstituted voice signals from said sampled signals, the reconstituted signals being connected to one of said facilities.

4,153,817

DIGITAL CONFERENCE CIRCUIT

Remo J. D'Ortenzio, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Tampa, Fla.

Filed Nov. 25, 1977, Ser. No. 855,075
Int. Cl.[2] H04M *3/56*
U.S. Cl. 179—18 BC **35 Claims**



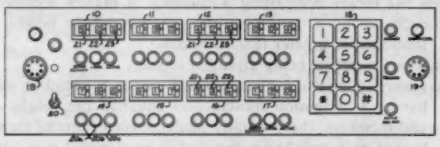
1. A method of combining telephone channels into a conference connection comprising sampling the data in each telephone channel to produce a subscriber signal for each channel, inverting the subscriber signal in at least one but not all of said telephone channels, summing the subscriber signals from each telephone channel including the inverted subscriber signals, successively subtracting from the sum of the subscriber signals the signal derived from each telephone channel to provide individual conference signals, and supplying said individual conference signals to each telephone channel, said step of sampling the data in each telephone channel including converting the sample into a digital word comprising a plurality of bits designating the magnitude of the sample and at least one bit designating the sign thereof.

4,153,818

TELEPHONE MULTILINE SIGNALING USING COMMON SIGNAL PAIR

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Radford R. Goodloe, Ormond Beach; Pierce C. Toole; Jerry L. Belt, both of Cocoa, all of Fla., and Donald B. Leininger, Yuma, Ariz.

Filed Jun. 23, 1978, Ser. No. 918,533
Int. Cl.[2] H04M *3/22*
U.S. Cl. 179—27 CA **7 Claims**



1. A mechanical selector for generating electrical coded signals representing a plurality of different commands regarding connections between a group of on-site telephone channels and a plurality of remote telephone lines, said selector comprising:

an on-site console;

a plurality of mechanically operable sets of switches carried on said console, one set of switches for each of said respective channels;

means for mechanically manipulating said sets of switches generating electrical signals representing a command request, a particular telephone line, and the channel that said particular telephone line is requested to be connected to;

a plurality of banks of AND gates representing units, tens, and hundreds;

means for connecting said signal representing said particular channel to designated gates of said plurality of banks of AND gates;

a group of channel gates corresponding to the channels at said on-site location;

means for connecting said signal representing the channel to which said particular telephone line is to be connected to a designated channel gate;

a command gate;

means for connecting said signal representing a command request to said command gate;

a shift register having a plurality of parallel output terminals with respective ones of said output terminals being connected to said command gates, said channel gates, and said AND gates;

means for generating a shift pulse responsive to manipulations of said switches for shifting a signal through said shift register for enabling said command gates, said channel gates and said AND gates;

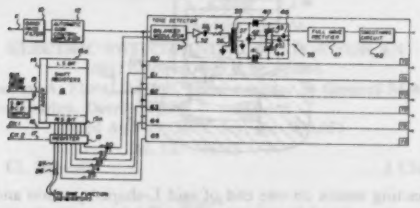
whereby output signals are produced by said command gates, said AND gates, and said channel gates identifying a particular command, a particular remote telephone line, and the on-site telephone channel to which the particular telephone line is to be connected.

4,153,819

TELEPHONE TONE SIGNALLING RECEIVER WITH UP-CONVERSION OF FREQUENCY OF TONES CONTROLLED BY WORD INSTRUCTIONS

Rolf E. Olsen, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 19, 1977, Ser. No. 862,110
Int. Cl.[2] H04M 7/12
U.S. Cl. 179—84 VF **6 Claims**



1. A tone receiver apparatus for use in combination with a telephone switching facility in a telephone network in which supervisory signalling is carried by audio frequency signals of predetermined frequencies, the tone receiver apparatus comprising:

means responsive to a plurality of word instructions from the telephone switching facility for generating a corresponding plurality of reference signals, each one having a respective fundamental frequency, greater than an audible frequency;

a plurality of modulator circuits each having a first input for receiving tone signals from the telephone network and a second input connected to the generating means for receiving a respective one of the reference signals, each modulator being responsive to the signals appearing at said first and second inputs for producing at its output an alternating current signal having a frequency removed from the frequency of the respective reference signal by the amount of the frequency of the tone signal received from the telephone network;

a plurality of rectifier circuits for generating a direct current in response to an alternating current, each of the rectifier circuits being associated with a respective one of the modulator circuits;

a plurality of filter circuits each having a predetermined pass band characteristic, each filter circuit being connected in series between one of the modulator circuits and its associated rectifier circuit, each filter circuit being adapted to pass signals within its pass band characteristic to the associated rectifier circuit, whereby a plurality of detectable tones is determined by the word instruction.

4,153,820

PAGING AMPLIFIER FOR A KEY TELEPHONE SYSTEM

Bruce R. Saxon, Harrisburg, Pa., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Nov. 18, 1977, Ser. No. 853,001
Int. Cl.[2] H04M 3/40; H03F 3/20
U.S. Cl. 179—1 A **21 Claims**

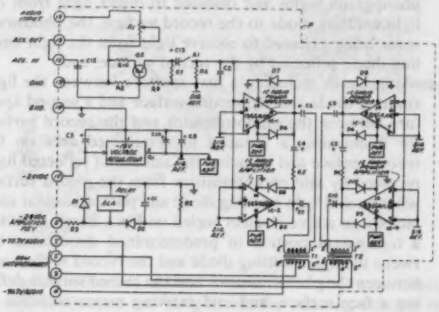
1. A paging amplifier for a key telephone system having a system ground and a system negative voltage power supply comprising:

audio signal input means;

a first pair of audio power amplifiers each having an inverting input, a non-inverting input, at least one ground input, a power supply input and an output, said inverting input of one of said first pair of amplifiers being coupled to said input means and said non-inverting input of the other of said first pair of amplifiers being coupled to said input means;

a first load having one terminal coupled to said output of one of said first pair of amplifiers and the other terminal coupled to said output of the other of said first pair of amplifiers;

a second pair of audio power amplifiers each having an inverting input, a non-inverting input, at least one ground input, a power supply input and an output, said inverting input of one of said second pair of amplifiers being coupled to said input means and said non-inverting input of



the other of said second pair of amplifiers being coupled to said input means; and

a second load having one terminal coupled to said output of one of said second pair of amplifiers and the other terminal coupled to said output of the other of said second pair of amplifiers;

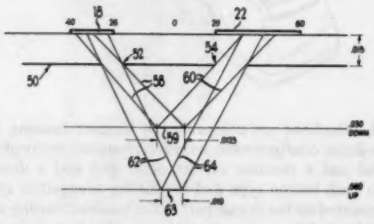
said first and second loads providing positive and negative amplified audio output signals for said paging amplifier.

4,153,821

OPTICAL SCANNER MASKING MEANS

Ralph H. Baer, Manchester, N.H., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 26, 1976, Ser. No. 745,216
Int. Cl.[2] G11B 17/06, 21/10
U.S. Cl. 179—100.4 D **8 Claims**



1. A scanner for use in a phonograph device having a phonograph tone arm and a phonograph stylus for detecting the presence of an unrecorded land area on a record surface comprising:

a light emitting diode and a phototransistor mounted in a side by side arrangement on the end of the phonograph tone arm generally adjacent to the phonograph stylus and oriented to direct light from the light emitting diode to the record surface, the phototransistor being oriented to receive light from the light emitting diode reflected by the record surface; and

masking means including a relatively thin opaque film applied to said light emitting diode and phototransistor having a first aperture between the light emitting diode and the record surface and a second aperture between the phototransistor and the record surface for illuminating a predetermined area on the record surface and reducing

the amount of reflected light received by said phototransistor from the record surface.

5. A scanner for use in a phonograph device having a phonograph tone arm and a phonograph stylus for detecting the presence of an unrecorded land area on a record surface comprising:

a light emitting diode and a phototransistor mounted on the end of the phonograph tone arm generally adjacent to the phonograph stylus and oriented to direct light from the light emitting diode to the record surface, the phototransistor being oriented to receive light from the light emitting diode reflected by the record surface; and

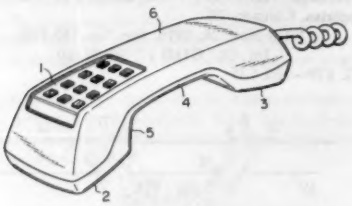
masking means including a first aperture between the light emitting diode and the record surface and a second aperture between the phototransistor and the record surface for illuminating a reduced predetermined area on the record surface and reducing the amount of reflected light received by said phototransistor from the record surface wherein said light emitting diode and phototransistor each include an active element sealed within a housing having a transparent portion of predetermined dimensions between the light emitting diode and the record surface and between the phototransistor and the record surface defining a face surface, and said masking means includes an opaque film on said face, said film having voids defining said first and second apertures.

4,153,822

TELEPHONE SET

Joji Ueda, and Hisao Fukushima, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,468
Claims priority, application Japan, Mar. 8, 1977, 52/244339
Int. Cl.[2] H04M *1/03, 1/06, 1/50*
U.S. Cl. 179—103 **5 Claims**



1. A telephone set comprising a handset housing with a cramp-shape configuration with a transmitter microphone on one end and a receiver on the other end and a detachable plug-in push button type dial for dialing plugged in and slidably mounted on the dorsal part of the handset housing approximately behind the receiver, said handset having a pair of guide projections and said dial having a pair of grooves positioned to fit with said guide projections.

4,153,823

TELEPHONE LOCK

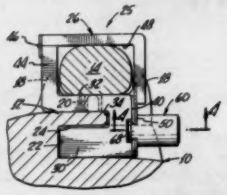
Maurice J. Hanson, 16400 Saybrook Lane, Space #98, Huntington Beach, Calif. 92649

Filed Jul. 6, 1978, Ser. No. 922,291
Int. Cl.[2] H04M *1/66*
U.S. Cl. 179—189 R **5 Claims**

1. In a telephone locking apparatus for a telephone having a base with a finger gripping cavity adjacent the cradle portion thereof with an interconnecting web portion, the cradle being configured for receiving a handset, the combination comprising:

a first member having a generally C-shaped portion with one arm thereof configured for engaging within the finger gripping cavity and the other arm thereof in generally abutting relation with the opposite surface of the interconnecting web portion;

a second member movably coupled to said first member, said second member having a generally L-shaped portion, said first and second members in assembled relation defining an opening for receiving therein and completely encircling the hand gripping portion of the handset; and



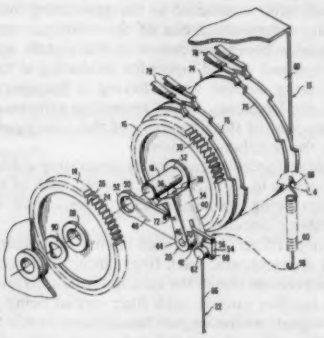
coacting means on one end of said L-shaped portion and a surface of said first member for receiving means for locking said first member relative to said second member whereby to retain the handset within the cradle of the telephone.

4,153,824

APPLIANCE CONTROL TIMER DRIVE MEANS

George O. Blackmond, 3016 Overbrook Dr., Port St. Lucie, Fla. 33452

Filed Oct. 19, 1977, Ser. No. 843,518
Int. Cl.[2] H01H *43/00*
U.S. Cl. 200—35 R **10 Claims**



1. In an automatic appliance having a rotary timer for control of operations performed by the appliance, a motor that powers the operation of the appliance and an element driven by said motor during operation of the appliance through repeated cycles of movement of substantially constant time duration, the improvement for powering said rotary timer which comprises:

a first wheel having a series of peripheral teeth substantially equidistantally spaced, at least one of said teeth being of greater depth than the substantially uniform depth of the remaining teeth,

a second wheel having a series of peripheral teeth substantially equidistantally spaced equivalent to the spacing of the teeth of said first wheel and having a depth substantially equal to the depth of said remaining teeth,

a shaft upon which said wheels are rotatably mounted adjacent each other, said first wheel being freely rotatable on said shaft and said second wheel being rigidly mounted to said shaft,

pawl means carried upon said shaft for rocking motion, said means comprising first and second prongs spaced apart

approximately the distance between said first and second wheels,

spring means biasing said pawl means toward said wheels for contact of said first and second prongs with the peripheries of said first and second wheels respectively, and

connector means extending between said pawl means and said motor driven element to pull said pawl means through a rocking motion in unison with the cyclic movement of said element.

4,153,825

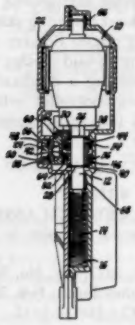
ELECTRIC SWITCH AND ACTUATOR FOR AN ANTENNA DRIVE SYSTEM

Raymond A. Flora, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 26, 1978, Ser. No. 900,051

Int. Cl.[2] H01Q *1/10*

U.S. Cl. 200—47 **1 Claim**



1. An electric switch and actuator assembly for an antenna drive having an electric motor driven worm shaft subject to longitudinal movement when the worm gear driven thereby encounters a predetermined resistance, said switch and actuator assembly comprising; a snap-action switch having first and second actuator arms, each arm having a switch contact thereon; first and second spring seats mounted on said worm shaft; retaining means secured to said worm shaft adjacent each of said spring seats for enforcing longitudinal movement of the first spring seat in one direction and the second spring seat in the other direction; a switch actuator tab on each of said first and second spring seats adjacent said first and second actuator arms respectively to actuate said first acutator arm when said worm shaft moves longitudinally in said one direction and to actuate said second actuator arm when said worm shaft moves longitudinally in said other direction; stop means abutting each of said first and second spring seats for preventing longitudinal movement of said first spring seat in said other direction and said second spring seat in said one direction; and spring means disposed between said spring seats urging each of said spring seats toward abutment with said respective stop means and said retaining means, and for imposing a predetermined longitudinal centering force on said worm shaft which force must be overcome before longitudinal movement of said worm shaft occurs.

4,153,826

ACTUATING MECHANISM FOR ELECTRICAL SWITCHES

Redreddy S. Reddy, Schaumburg, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Oct. 21, 1976, Ser. No. 734,389

Int. Cl.[2] H01H *27/06*

U.S. Cl. 200—44 **14 Claims**

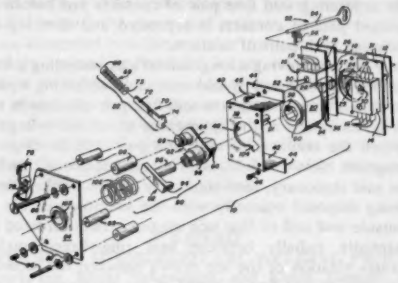
1. An actuating mechanism for electrical switches comprising:

a support frame,

at least one electrical switch mounted on said frame

a cam rotatably mounted on said frame adjacent said switch such that said cam, upon being rotated actuates said switch at a selected angular position of said cam,

means for rotating said cam, and



a toggle mechanism secured to said frame and to said cam, said mechanism including means for resisting rotation of said cam for a first portion of said rotation of said cam and for assisting the rotation of said cam during a second portion of the rotation of said cam to said selected angular position.

4,153,827

MAGNETIC BLOW-OUT ARC EXTINGUISHING DEVICE

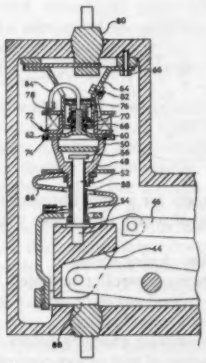
Jean-Louis Mircovich, Seyssins; Marcel Macaire, Grenoble; Rene Charlas, St. Egreve, and Gerard Le Floch, Seyssinet, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Jan. 10, 1977, Ser. No. 758,146

Claims priority, application France, Jan. 26, 1976, 76 02084; Jan. 26, 1976, 76 02087

Int. Cl.[2] H01H *33/66*

U.S. Cl. 200—144 B **4 Claims**



1. A magnetic blow-out arc extinguishing device comprising:

two pairs of separable contacts connected electrically in series including a stationary contact having a ring-shaped contact surface, a movable contact having a ring-shaped contact surface and a semi-stationary support member interposed between said stationary and movable contacts and having a first ring-shaped semi-stationary contact surface confronting and cooperating with said ring-shaped contact surface of said stationary contact to form a first pair of contacts and a second ring-shaped semi-stationary contact surface cooperating with said ring-shaped contact surface of said movable contact to form a second pair of contacts, said first and second ring-shaped semi-stationary

contact surfaces being connected electrically and mechanically to each other,

actuating means for moving said movable contact towards the separated position of said pairs of separable contacts,

means for moving said semi-stationary support member to follow said movable contact along a predetermined stroke for separating said first pair of contacts just before said second pair of contacts is separated and drawing arcs between both pairs of contacts,

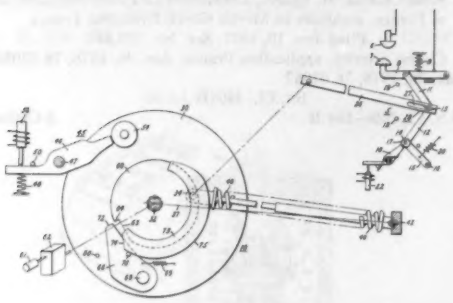
a blow-out coil having a longitudinal axis extending parallel to the path followed by said arcs, said coil having a pair of terminals connected across said first pair of contacts so as to be energized at the appearance of an arc-voltage between the contacts of said first pair and developing a magnetic blow-out field, said ring-shaped contact surfaces on said stationary, semi-stationary and movable contacts being disposed coaxially with the longitudinal axis and outside said coil so that said magnetic field directed substantially radially between said ring-shaped surfaces causes rotation of the arc drawn between the separated contacts of said first pair and of the arc drawn between said second pair of contacts.

4,153,828

STORED-ENERGY OPERATING MEANS FOR AN ELECTRIC CIRCUIT BREAKER

Philip Barkan, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Jul. 8, 1976, Ser. No. 703,328
Int. Cl.[2] H01H *3/30*
U.S. Cl. 200—153 SC **9 Claims**



1. In operating means for a circuit breaker that comprises a pair of contacts, one of which is movable with respect to the other,

(a) a circuit-breaker closing spring,

(b) a rotatable spring-controller mounted for rotation between first and second angularly-spaced dead-center positions with respect to said spring,

(c) means for transmitting charging forces to said spring in response to rotation of said spring-controller in a forward direction toward said first dead-center position,

(d) means for forwardly rotating said spring-controller from said second to said first dead-center position, thereby charging said spring,

(e) said spring acting to discharge and thereby further to rotate said spring-controller in a forward direction when said spring-controller has been rotated in a forward direction past said first dead-center position,

(f) releasable stop means coacting with said spring-controller for blocking said further forward rotation of said spring-controller, said stop means being releasable to permit said spring to rapidly discharge and continue forward rotation of said spring-controller into said second dead-center position,

(g) said spring-controller oscillating about said second dead-center position immediately following said rapid discharge of said spring,

(h) means for closing said circuit breaker in response to forward rotation of said spring-controller into said second dead-center position comprising:

(h1) a mechanically trip-free operating mechanism coupled to said movable contact,

(h2) a linkage interconnecting said spring-controller and said operating mechanism,

(h3) pin and slot coupling means between said linkage and said operating mechanism which: (i) transmit closing force between said spring-controller and said operating mechanism during forward rotation of said spring-controller into said second dead-center position, (ii) allows said spring-controller to oscillate about said second dead-center position at the end of a closing operation without actuating said operating mechanism, whereby said circuit breaker can remain closed despite said oscillations, and (iii) allows said spring-controller to be forwardly moved from said second to said first dead-center position without actuating said operating mechanism, whereby said circuit breaker can remain closed during said charging of said closing spring,

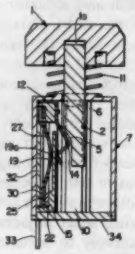
(i) and said linkage entering a dead-center position with respect to said spring-controller when said operating mechanism reaches a fully-closed position of the circuit breaker.

4,153,829

PUSHBUTTON SWITCH ASSEMBLY

Taneo Murata, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 16, 1977, Ser. No. 768,982
Claims priority, application Japan, Feb. 20, 1976, 52-19244
Int. Cl.[2] H01H *3/12*
U.S. Cl. 200—340 **1 Claim**



1. A push button switch comprising:

(a) a housing;

(b) a contact unit held within said housing, said contact unit including

(i) a fixed contact member,

(ii) a movable contact member disposed in parallel, spaced relation with said fixed contact member and having a disc portion bowing from the center portion of said movable contact member so as to normally extend away from said fixed contact member,

(iii) an insulating member interposed between said fixed and said movable contact members and having an opening therein aligned with said disc portion, and

(iiii) a resilient member disposed adjacent said movable contact member and having a projection extending toward the center portion of said disc portion;

(c) a spring member having a first portion angling outwardly away from said resilient member and a second portion angling back towards said resilient member; and

(d) a lever supported for reciprocal sliding movement within said housing and adapted to engage against said first portion of said spring member upon movement in one direc-

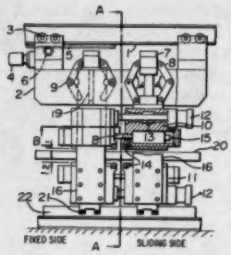
tion so as to urge said spring member against said resilient member to push said disc member by a snap action thereof through said opening of said insulating member and into contact with said fixed contact member.

4,153,830

WELDING APPARATUS

Toshihiko Baba; Akiyoshi Uomori, and Tadayasu Tsuchitani, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1977, Ser. No. 839,450
Claims priority, application Japan, Oct. 7, 1976, 51-121081
Int. Cl.[2] B23K *11/02*
U.S. Cl. 219—101 **3 Claims**



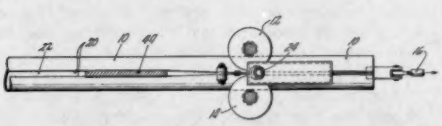
1. A welding apparatus which comprises (a) a pair of suspension type electrode press devices comprising:
a clamp cylinder having a protractable cylinder rod;
a link mechanism connected to said clamp cylinder for shifting said clamp cylinder in the vertical direction;
a slide frame connected to said clamp cylinder body, said slide frame being shiftable in the vertical direction with said cylinder body;
an upper press frame having an upper electrode, said upper press frame movably disposed in said slide frame and connected to the cylinder rod of said clamp cylinder, said upper frame being moved in said slide frame when the cylinder rod is protracted;
a lower press frame having a lower electrode, said lower press frame fixed on said slide frame to shift with said slide frame, and the lower electrode faced to said upper electrode; and
(b) an up-setting mechanism for moving one of said pair of electrode press devices in the direction of the other electrode press device in the horizontal direction,
whereby the clamping operation of said upper electrode and said lower electrode in perpendicular relation to a workpiece is performed synchronously.

4,153,831

PLASMA ARC WELDER FOR TITANIUM BLADE SPARS

Michael A. Renzulli, Trumbull, and Fiorentino G. DelMastro, Monroe, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 27, 1977, Ser. No. 846,092
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 P **3 Claims**



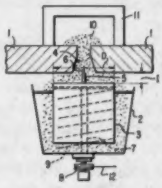
1. In a plasma arc welding machine for making longitudinal welds in titanium blade spars comprising a supporting bed, sets of capstan rollers on said bed for progressively narrowing the gap between confronting edges of a tubular preform to be welded as said preform is drawn through said rollers, a frame on said machine above said preform, a plasma arc torch mounted on said frame above the gap in said preform, a vertical plate extended through said gap into said preform, a mandrel carried by said plate and extended to a point downstream of said torch, a lower gas containing trailer mounted on said mandrel beneath the gap in said preform, said trailer comprising an elongated box-like member open at the top, resilient members upstanding from the longer sides of said trailer in position to engage the underside of said preform on opposite sides of said gap, arcuate closure members on the ends of said trailer adapted to engage the inside of said preform upstream and downstream of said torch, and resilient means on said mandrel for supporting said trailer for bodily movement in vertical planes including said preform.

4,153,832

OVERHEAD SUBMERGED ARC WELDING PROCESS

Katsuro Iio; Naoki Takenouchi, and Kimio Yamada, all of Fujisawa, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Sep. 13, 1976, Ser. No. 723,046
Claims priority, application Japan, Sep. 11, 1975, 50-109499; Nov. 19, 1975, 50-138208; Nov. 19, 1975, 50-139536; Mar. 11, 1976, 51-25605; May 7, 1976, 51-52502
Int. Cl.[2] B23K *9/18*
U.S. Cl. 219—124.34 **19 Claims**



1. An overhead submerged plate arc welding process wherein a flux for submerged arc welding is supplied from the underside of the welding line by a flux supply cylinder disposed within a flux supply hopper, the process comprising the steps of:
securing a first and second plate in adjacent relationship
mounting a shaft member, having a plurality of helical vanes mounted thereon, within said container;
simultaneously feeding a consumable electrode from the underside of the welding line through said shaft and rotating said shaft member so as to rotate said plurality of helical vanes and supply said flux; and
maintaining the interrelationship between said flux supply cylinder and the plates to be welded such that the length I from the under surfaces of said plates to be welded and the upper end of the open flux supply cylinder and the diameter D of the opening at the end of said flux supply cylinder is represented by the formula of $2 \leqq D/I \leqq 15$.

4,153,833

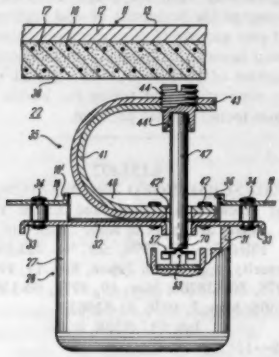
ELECTRIC HOT PLATE ASSEMBLY WITH A TEMPERATURE LIMITER

Karl Fischer, Am Gaensberg 8, 7519 Oberderdingen, Fed. Rep. of Germany, and Klaus Barth, Bretten-Goelshausen, Fed. Rep. of Germany, assignors to Karl Fischer, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 794,207, May 5, 1977, Pat. No. 4,122,330. This application Aug. 3, 1978, Ser. No. 930,636
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735426
Int. Cl.[2] H05B *3/68*
U.S. Cl. 219—449 **5 Claims**

1. An electric hot plate assembly including an electrically heated hot plate having at least one electrical conductor dis-

posed therewithin for heating an annular zone of the plate when energised, cover means defining an enclosed space located immediately beneath said hot plate and secured thereto, and a device for limiting the operating temperature of the hot plate, the temperature limiting device comprising an electrically non-conductive housing, a bimetallic element projecting from said housing into said enclosed space at a location beneath said annular zone, the housing having a base portion disposed externally of said enclosed space, connecting terminals located in the base portion of the housing for connecting said at least one hot plate conductor to an electrical supply, and switch means located in said base portion of the housing and adapted to be actuated by the bimetallic element by an electrically non-conductive pressure rod means, said bimetallic element being curved, the first end of said bimetallic element being in pressure engagement with said pressure rod means acting on said switch means, the second end of said bimetallic element being fixedly mounted adjacent a passage for said pressure rod means into said base portion.

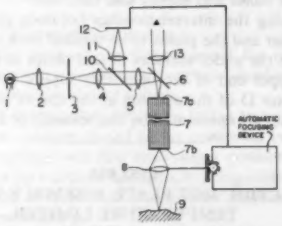


4,153,834

PATTERN PROJECTOR FOR AUTOMATIC FOCUSING ENDOSCOPE

Yoshisada Hayamizu, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1977, Ser. No. 817,852
Claims priority, application Japan, Jul. 20, 1976, 51-86260
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—201 **6 Claims**



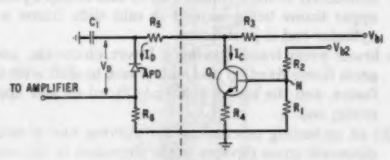
1. An endoscope system, comprising:
(a) an image fiber having an object end and an observer end;
(b) a light intensity detector related to the observer end of the image fiber for detecting the intensity of light emanating from the observer end of the image fiber;
(c) a focusing lens adjustably related to the image fiber so that when the observer end of the image fiber is aimed at an object, the focusing lens may be adjusted to maximize an intensity of illumination at the detector as an indication that the object has been brought into focus upon the detector;
(d) a pattern having at least two adjoining sharply contrasting regions;
(e) means for illuminating said pattern;
(f) an optical system for projecting said pattern, as illuminated by said illuminating means, upon the observer end of said image fiber for transmission through said image fiber and onto said object,
whereby:
even though said object may have no regions of sufficiently high contrast as to otherwise permit detection at the detector of when said object has been brought into focus at the detector, the reflection of the projection of said illuminated pattern from said object as detected at said detector provides said sufficiently high contrast; and
(g) said detector being so arranged relative to the image fiber observer end that said reflection reaches said detector from said object without intermediately reaching the illuminated pattern.

4,153,835

TEMPERATURE COMPENSATION CIRCUIT

Chun-Lim Lau, Brooklyn, N.Y., and Richard G. Smith, Basking Ridge, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1977, Ser. No. 827,617
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—214 C **4 Claims**



1. A temperature compensation circuit comprising
a transistor having emitter, base and collector electrodes,
an avalanche photodiode connected between said collector electrode and a source of reference potential so as to reverse bias said photodiode, said photodiode having the characteristic that to maintain its gain fixed at a predetermined level with increasing temperature, the reverse bias voltage applied thereto must increase essentially linearly with increasing temperature,
a plurality of resistors forming a voltage divider and having a node separating said plurality into two branches, said node being connected to said base electrode,
one of said branches including a thermistor and being connected between said node and said source of reference potential, and the other of said branches being connected between said node and a source of bias voltage,
said branches being mutually adapted so that the ratio of the resistance of said one branch to the sum of the resistances of said two branches decreases essentially linearly with temperature over the operating range of said circuit so that the gain of said photodiode remains essentially constant at said predetermined level with changes in temperature.

4,153,836

METHOD OF ALTERING THE GRADATION IN ELECTROSTATIC RECORDING OF HALF-TONE IMAGES

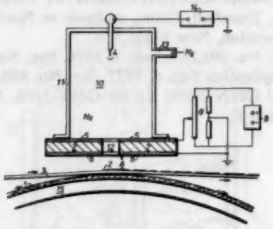
Walter Simm, Leverkusen, Fed. Rep. of Germany, assignor to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed Oct. 6, 1977, Ser. No. 839,778

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1976, 2645928

Int. Cl.[2] H01T *19/04*

U.S. Cl. 250—325 **5 Claims**



1. A method of altering the gradation in the electrostatographic recording of latent charge images of half-tone originals, comprising the steps of producing a first latent charge image employing a charging current to record said first image on a primary recording carrier, directing a sheet material between the primary recording carrier and a charging current means for charging the surface of the sheet material facing the charging means, placing the primary recording carrier in contact with the surface of the secondary recording carrier opposite to the charge receiving surface, employing said charging current to record by a charge transfer process said first image as a second latent charge image of altered gradation on said sheet material as a secondary recording carrier, controlling said charging current by electrical potential at a slot-like aperture formed in a diaphragm comprised of electrically conductive layers separated by insulating material.

4,153,837

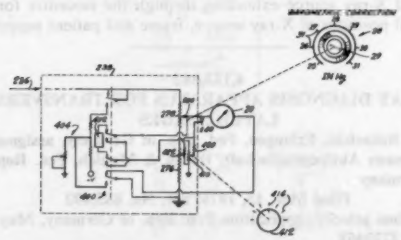
OPTICAL GAS ANALYZER

Thaddeus C. Ross, Santa Barbara, Calif., assignor to ANARAD, Inc., Santa Barbara, Calif.

Filed Feb. 16, 1978, Ser. No. 878,215

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—343 **6 Claims**



1. In a gas concentration analyzer having a chamber for a sample gas to be analyzed in which the pressure of the sample gas is affected by atmospheric pressure, optical means for producing a spectral line generally proportional to the concentration of a gas in the sample but affected by the pressure of the sample gas in the chamber, detector means for converting the spectral line into a corresponding electrical signal, signal processing system means for processing the electrical signal into a signal indicating the concentration of the gas in the sample gas, a display device normally connected to the signal processing means for normally displaying the concentration-indicating signal as a readout of the gas concentration, and barometric correction means connected to the display device for adjusting the readout to compensate for the effect of the atmospheric pressure; an improved pressure calibration apparatus comprising:

a power supply;

a scaler for scaling power from the supply to indicate atmospheric pressure on the display device; and

a switch for switching the display device from the normal connection to the signal processing system means for displaying the gas concentration to connection to the scaler while retaining the connection of the barometric correction means to the display device for now calibrating the barometric correction means precisely to the atmospheric pressure with the pressure then indicated on the display device.

4,153,838

SCINTILLATION-TYPE X-RAY DETECTOR AND RADIOLOGY APPARATUS INCORPORATING SUCH DETECTOR

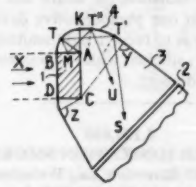
Christian Mayeux, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Nov. 16, 1977, Ser. No. 851,922

Claims priority, application France, Nov. 26, 1976, 76 35751

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—368 **10 Claims**



1. A radiation detector, especially for X-radiation, which includes a scintillator crystal disposed to receive from a source a beam of X-radiation having a given direction at one part thereof; a light collector made from a material transparent to light detectable by a photomultiplier tube; a photomultiplier tube, disposed in association with said light collector to receive therefrom at least a portion of the light emitted by said scintillator crystal, the exterior surface of said light collector being provided with a reflecting layer constituting a reflecting surface for reflecting said light back into said light collector and in which the improvement comprises:

said light collector surrounds substantially the entirety of said scintillator crystal except for that part of its surface exposed to said X-radiation;

said reflecting surface of said light collector is so shaped that its intersection with a plane defined jointly by said direction of said beam of X-radiation and by the central axis of said photomultiplier is a curve whose evolute is tangent or external to said scintillator crystal.

4,153,839

RADIOGRAPHY

Godfrey N. Hounsfield, Newark, and Tai Y. Chan, Old Windsor, both of England, assignors to EMI Limited, Hayes, England

Filed Aug. 11, 1977, Ser. No. 823,639

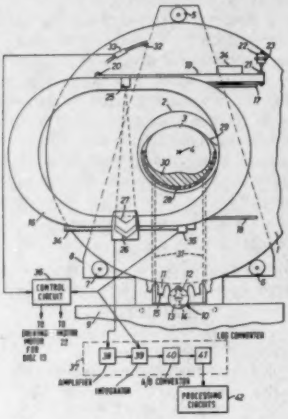
Claims priority, application United Kingdom, Aug. 28, 1976, 35911/76

Int. Cl.[2] G01T *1/20*; G01N *21/34*

U.S. Cl. 250—366 **13 Claims**

1. A scintillator crystal, for converting penetrating radiation to electromagnetic radiation, which is substantially of a wave-

length in the visible band, for measurement by at least one photosensitive device, said crystal having a plurality of substantially planar surfaces including a first surface for receiving the penetrating radiation and a second surface suitable to permit the electromagnetic radiation to exit therethrough, the arrangement of the said surfaces being such that, for a first



surface or a projection thereof on the perpendicular to an input beam of penetrating radiation, of width less than the input surface of said at least one photosensitive device, the second surface is disposed so as to receive light emitted in response to the radiation but is of sufficient width to accommodate the said input surface of said device.

4,153,840

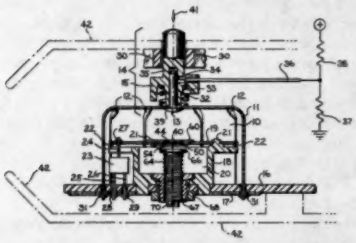
DOUBLE CHAMBER IONIZATION SMOKE DETECTOR

Horst K. Wieder, 1207 Riverview La., Watertown, Wis. 53094

Continuation-in-part of Ser. No. 592,028, Jun. 30, 1975. This application Dec. 27, 1976, Ser. No. 754,276

Int. Cl.[2] G01T *1/18*; G01N *23/12*

U.S. Cl. 250—381 **7 Claims**



2. In a combustion product detector comprising two radioactive sources and two ionization chambers each comprising an electrode, one of said chambers being vented to the ambient atmosphere through one of said electrodes and the other chamber adapted to serve as a reference and substantially partially surrounded by said venting electrode, the combination characterized by: p1 said venting electrode provided with an aperture to receive a test member, and

a test member comprising an electrically non-conductive portion and an electrically conductive portion,

said test member supported to extend through said aperture into said vented chamber to provide said electrically conductive portion substantially inside said chamber and said electrically non-conductive portion substantially outside said chamber with said electrically conductive portion in electrical contact with said venting electrode,

biasing means providing a biasing force to bias said test member away from said venting electrode,

said test member manually moveable against said biasing force to extend further into said chamber to produce a change in the ionization current in said chamber,

said electrically conductive portion being grounded through a resistor.

4,153,841

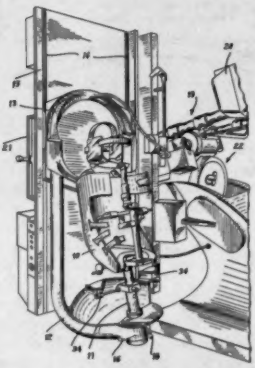
PNEUMOENCEPHALOGRAPHY CHAIR

Pieter W. Kok, Trumbull, Conn., assignor to North American Philips Corporation, New York, N.Y.

Division of Ser. No. 691,289, Jun. 1, 1976, Pat. No. 4,071,231. This application Sep. 6, 1977, Ser. No. 830,759

Int. Cl.[2] G01N *21/00, 23/00*; G21K *5/06, 5/08*

U.S. Cl. 250—439 R **3 Claims**



1. X-ray diagnostic apparatus, comprising an image recording device positioned to intercept X-rays from an X-ray source, a tiltable patient table in the path of X-rays between the image recording device and the X-ray source, a frame mounted on and rotatable with respect to the table, a patient support in said frame, said frame being rotatable with respect to the stationary table about a first axis extending perpendicularly to the plane of the table in a plane parallel to the plane of the table, the patient support being rotatable with respect to the frame about a second axis which intersects the first axis in an isocentre situated above the plane of the table, said second axis enclosing an acute angle with the plane of the table, a central ray of said X-ray source extending through the isocentre for all mutual positions of X-ray source, frame and patient support.

4,153,842

X-RAY DIAGNOSIS APPARATUS FOR TRANSVERSE LAYER IMAGES

Josef Rohmfeld, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,492

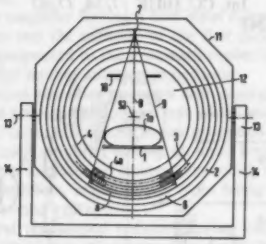
Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723462

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **2 Claims**

1. An x-ray diagnostic apparatus for producing transverse layer images of a radiographic subject, comprising an x-ray measuring arrangement including an x-ray source for producing an x-ray beam penetrating a transverse layer region of a radiographic subject with the beam having a cross-sectional extent perpendicular to the plane of the layer region generally equal to the layer thickness, and a radiation receiver for determining the radiation intensity issuing from the layer region; a

convertor connected to the radiation receiver for transforming the signals delivered by the radiation receiver into a tomographic image; the x-ray source comprising a ring-shaped anode arrangement, and a series of cathodes being arranged opposite the anode arrangement; and beam shifting means for changing the direction of the symmetry axis of the x-ray beam comprising means for the stepwise switching on of electron radiation between at least one cathode in each instance and the anode arrangement; the radiation receiver being of a ring configuration for surrounding the layer region and being disposed radially inwardly relative to the x-ray source, and com-



prising a series of individual detectors; characterized in each detector (30 through 35, etc.) being adjustably mounted such that it can be brought, independently of the other detectors, from a position clear of the x-ray beam (9) into a position in which it is impinged upon by the x-ray beam (9), and a device (37 through 42) being coupled with said detectors for effecting the detector adjustment in dependence upon the respective position of the symmetry axis (8) of the x-ray beam (9) such that the x-ray beam (9) initially passes by the detectors (30 through 35, etc.), and then impinges upon a corresponding selectable number of detectors (30 through 35, etc.).

4,153,843

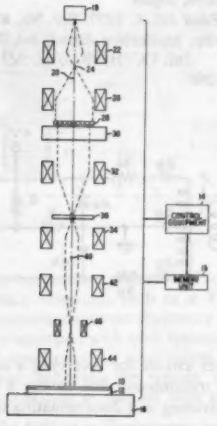
MULTIPLE BEAM EXPOSURE SYSTEM

Roger F. W. Pease, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 780,354, Mar. 23, 1977, abandoned. This application Aug. 9, 1978, Ser. No. 932,265

Int. Cl.[2] H01J *37/00*

U.S. Cl. 250—492 A **23 Claims**



1. Apparatus for scanning multiple radiant beams over the surface of a radiation-sensitive workpiece to define patterns therein, said apparatus comprising

a single electron source of radiation,

means responsive to radiation from said single source for forming multiple spaced-apart radiant beams,

means for independently blanking each of said beams,

and means for demagnifying and scanning said independently blanked beams in unison over the surface of said workpiece.

4,153,844

MEASURING APPARATUS FOR DEGREE OF SPIN POLARIZATION OF AN ELECTRON BEAM

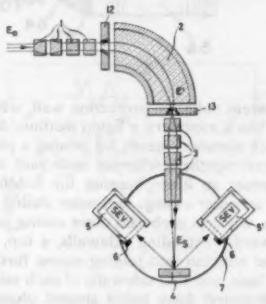
Jurgen Kirschner, Aachen, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,711

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646394

Int. Cl.[2] G21K *1/10*

U.S. Cl. 250—492 R **6 Claims**



1. Apparatus for determining the degree of spin polarization of an electron beam, in which there are provided a monocrystal of electrically conducting or semiconducting material having a surface disposed perpendicularly to the radiation direction of said electron beam and formed parallel to a crystal structure plane designed to scatter the electrons of said beam, and also means for measuring the intensity of backscattering of electrons by the monocrystal in two respective directions at complementary angles to said radiation direction of said beam, having the improvement consisting in that:

(a) first means for accelerating or decelerating electrons, consisting of a plurality of electron lens elements of tubular or of diaphragm form at different electrical potentials are provided for accelerating or decelerating the electrons of said beam to velocities suitable for monochromatizing said electrom beam to a degree required in a subsequent stage;

(b) monochromatizing means downstream of said first accelerating or decelerating means are provided for monochromatizing said electron beam;

(c) second means for accelerating or decelerating electrons, consisting of electron lenses of tubular or diaphragm form, are provided and located downstream of said monochromatizing means for adjusting the energy to a value required for the scattering of the electrons of the monochromatized beam and for focussing the beam on said surface of said monocrystal;

(d) said monocrystal is arranged next in line downstream of said second accelerating or decelerating means;

(e) said means for measuring electron backscattering intensity consists essentially of at least one pair of detectors for measuring the intensity of electron beams backscattered at complementary angles from said surface of said monocrystal, and

(f) means interposed between said surface of said monocrys-

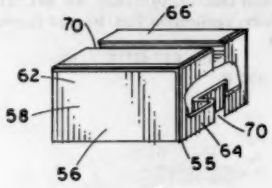
tal and said backscattering intensity measuring means are provided for separating or deviating the low-energy portion of the backscattered electrons produced by ineleastic interaction of electrons of said beam with said monocrystal.

4,153,845

TRANSPARENT RADIATION WALL

Lawrence Fava, R.F.D. 5, Janebar Circle, Plymouth, Mass. 02360

Filed Aug. 24, 1976, Ser. No. 717,159
Int. Cl.[2] G21F *3/04*
U.S. Cl. 250—517 **7 Claims**



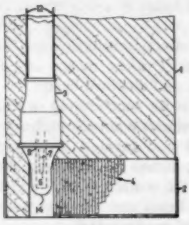
1. A transparent radiation protection wall, which comprises a plurality of block members, a liquid medium deposed within each said block member, means for joining a plurality of said block members together, wherein each said block member further comprises an inner housing for holding said liquid medium, and an outer casing, said outer casing covering said inner housing, wherein each said outer casing includes a base, a pair of upwardly extending sidewalls, a top, and a pair of open ends and wherein said joining means further comprises said top, said base, and said sidewalls of each said outer casing having an elongated dove tailed shaped channel therein, a plurality of elongated bar members, each said bar member having two dove tailed shaped edges, one said dove tailed shape edge of one said bar received into one said dove tailed shaped channel of one said outer casing and other said dove tailed shaped edge of one said bar received into one said dove tailed shaped channel of a second said outer casing.

4,153,846

DETECTOR FOR LIQUID MEDIA

Paul G. Watterback, Stockholm, Sweden, assignor to AB Sibe International, Solna, Sweden

Filed Jul. 25, 1977, Ser. No. 818,667
Claims priority, application Sweden, Mar. 23, 1977, 7703328
Int. Cl.[2] H01H *35/18*
U.S. Cl. 307—118 **4 Claims**



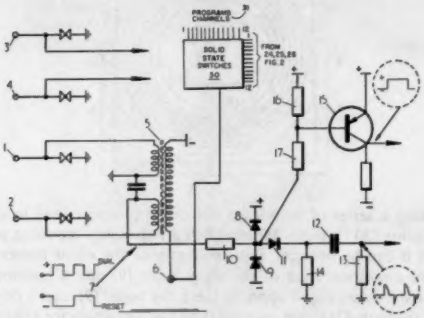
1. A detector for detecting the presence of a liquid medium comprising: an ampule containing an electrolyte liquid; a galvanic element having an elelctrolyte chamber which in its inactive state lacks electrolyte, said galvanic element being capable of producing an electric current when electrolyte is supplied to said electrolyte chamber; and sensing means for activating said galvanic element in response to the presence of the liquid to be detected, said means including a swelling body which swells upon contact with the liquid to be sensed, the swelling of said body effecting transfer of electrolyte from said ampule to said electrolyte chamber.

4,153,847

LOGIC CIRCUITS

Eric J. Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England

Filed Oct. 28, 1977, Ser. No. 846,592
Claims priority, application United Kingdom, Nov. 10, 1976, 46864/76
Int. Cl.[2] H03K *17/56, 17/62*
U.S. Cl. 307—243 **6 Claims**



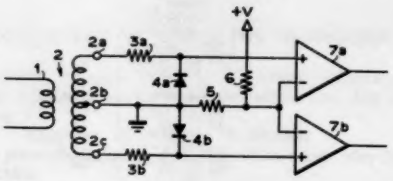
1. A logic circuit for controlling a plurality of solid state switches, comprising said solid state switches, an input to said logic circuit to which distinguishable dialling and reset pulse signals are applied, a plurality of outputs to which the respective solid state switches are connected, means for distinguishing between the dial and reset pulse signals, means for sequentially switching the outputs in response to dial pulse signals, and means for resetting the outputs to a datum condition in response to the reset and pulse signals.

4,153,848

RECEIVER CIRCUIT

Seiichi Miyazaki, Wakou, Japan, assignor to Ohkura Electric Co. Ltd., Tokyo, Japan

Filed Jul. 6, 1977, Ser. No. 813,296
Claims priority, application Japan, Jul. 7, 1976, 51-90154[U]
Int. Cl.[2] H03K *5/01, 5/153*
U.S. Cl. 307—268 **3 Claims**



1. A receiver circuit for receiving a double current pulse signal from a transmission line having a characteristic impedance and delivering in a discriminating manner, positive and negative pulses corresponding to that of the double current pulse signal, said receiver circuit comprising:

(a) an input transformer having a primary winding connected to the transmission line and a secondary winding

divided into a first half having a first output, a second half having a second output, and a grounded center terminal;

(b) a first resistor connected in series with the first output having a higher resistance value than the characteristic impedance of the transmission line;

(c) a second resistor connected in series with the second output having a higher resistance value than the characteristic impedance of the transmission line;

(d) a first diode having a cathode connected to the first resistor and an anode connected to the grounded center terminal;

(e) a second diode having a cathode connected to the second resistor and an anode connected to the grounded center terminal;

(f) a first amplifier having a first input connected to the first resistor and the cathode of the first diode and a second input connected to the grounded center terminal, the first amplifier having an input impedance;

(g) a second amplifier having a first input connected to the second resistor and the cathode of the second diode and a second input connected to the grounded center terminal, the second amplifier having an input impedance;

(h) the first and second diodes preventing the first and second amplifiers, respectively, from being supplied with a high reverse voltage;

(i) the first and second resistors having values such that an input impedance of said receiver circuit is higher than the characteristic impedance of the transmission line; and

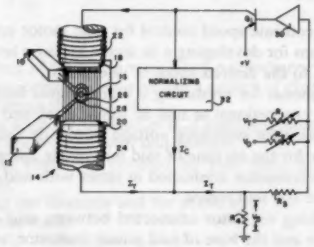
(j) a third resistor having a resistance value and connected in series between the grounded center terminal and second inputs of the first and second amplifiers, respectively, the input impedance of the first amplifier being higher than the resistance value of each of the first and third resistors and the input impedance of the second amplifier being higher than the resistance value of each of the second and third resistors.

4,153,849

CIRCUIT FOR NORMALIZING DEVICES HAVING CURRENT-CONTROLLED FREQUENCY RESPONSE TO PREDETERMINED I-F CHARACTERISTIC

Stanley R. Hall, Westlake Village, and Armando Benavides, Los Angeles, both of Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 1, 1977, Ser. No. 820,689
Int. Cl.[2] H03K *1/02*
U.S. Cl. 307—295 **12 Claims**



1. Apparatus for normalizing a device which has a current-controlled frequency response, such as a YIG or a TWM device, to a predetermined current-frequency characteristic in order that a device equipped with such apparatus can, through said apparatus, be preadjusted for substitution in a system for a like device without realigning the system, said normalizing apparatus being connected in parallel with the device, comprising

a transistor and a compensating current-sensing resistor in series with said transistor and with a load resistance, said transistor and series resistor being connected in parallel with said device to conduct a shunt compensating current, I_C, through the transistor, first feedback control means connected to a junction between said transistor and series resistor for applying a control voltage to said transistor whereby said compensating current is set to a desired level to offset the current-frequency characteristic of the composite device and apparatus from that of the device to a predetermined level, and

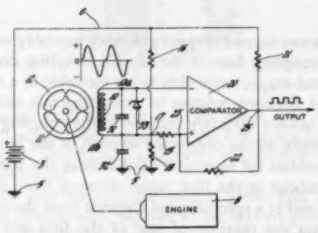
second feedback control means connected to a junction between said series resistor and said load resistance for applying a feedback control voltage to said transistor to adjust the offset characteristic to a predetermined slope by adjusting the gain of said feedback control means.

4,153,850

CIRCUIT FOR PRODUCING A SERIES OF SUBSTANTIALLY SQUARE WAVE OUTPUT SIGNALS

James A. Boyer, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 17, 1977, Ser. No. 807,557
Int. Cl.[2] H03K *5/20*
U.S. Cl. 307—354 **3 Claims**



1. A circuit for producing a series of substantially square wave output signals having the edges thereof synchronized with the polarity transitions of a series of alternating current input signals comprising in combination with a unidirectional supply potential source and a source of a series of alternating current input signals: a voltage comparator circuit having output circuit means first and second input circuit means across which said alternating current input signal source is electrically connected for triggering, said voltage comparator circuit from a first operating condition to a second operating condition and vice versa in response to each reversal of polarity of said series of alternating current input signals; and means for developing a direct current bias potential of a selected level in series aiding relationship with both half cycles of said series of alternating current input signals for providing an instantaneous potential across said input circuit means of said comparator circuit that is the sum of said bias potential plus the instantaneous potential value of said alternating current input signal.

4,153,851

MAGNETIC COUPLING

Jiri J. Hovorka, Muskogee, Okla., assignor to Orin W. Coburn, Muskogee, Okla.

Filed Jul. 14, 1977, Ser. No. 815,669
Int. Cl.[2] H02K *7/06*
U.S. Cl. 310—23 **28 Claims**

1. A magnetic coupling, comprising:

a first coupling member having a substantially planar coupling face;

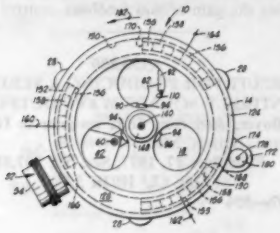
a second coupling member having a substantially planar coupling face, the coupling face of the second coupling member being disposed in a plane substantially parallel to the planar disposition of the coupling face of first coupling member and spaced a distance therefrom;

means rotatingly supporting one of the first coupling member and the second coupling member for allowing rotation

of one of the first coupling member and the second coupling member relative to the other of the first coupling member and the second coupling member about a coupling axis;

means for rotating one of the first and the second coupling members about the coupling axis;

at least one first magnet assembly connected to the coupling face of the first coupling member, each first magnet assembly being spaced a first radial distance from the coupling axis;



at least one second magnet assembly movably supported on the coupling face of the second coupling member, each second magnet assembly being movable in a radially outward direction relative to a coupling axis and in an radially inward direction relative to the coupling axis; and

positioning means connected to each of the second magnet assemblies for alternately positioning the second magnet assemblies at the first radial diatance from the coupling axis and at a second radial distance from the coupling axis during the rotation of one of the first and the second coupling members.

4,153,852

CQMPACT PIEZOELECTRIC LIGHTER FOR GAS FIXTURES

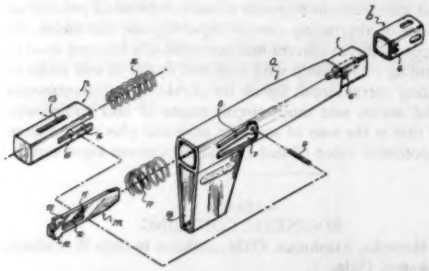
Ernesto A. Vainer, Paraguay 1102, Buenos Aires, Argentina

Filed Jan. 26, 1977, Ser. No. 762,731

Claims priority, application Argentina, Apr. 3, 1976, 262.062

Int. Cl.[2] H01L *17/10*

U.S. Cl. 310—339 **4 Claims**



1. A compact piezoelectric lighter comprising, in combination:

(a) a support body of resilient material, said body having a first end, a second end and grooves which define elastically deformable lugs;

(b) piezoelectric ignition means for creating a spark, said piezoelectric means housed in said first end;

(c) a pulsator member displaceably housed in said second end;

(d) an impact hammer displaceably housed in said pulsator;

(e) a load spring housed between said pulsator member and said impact hammer;

(f) a return spring housed between said hammer and said piezoelectric means; and

(g) a rod positioned through said body, said pulsator and said hammer;

(h) means for retaining said impact hammer in an initial retention position while said pulsator member is displaced toward said piezoelectric means, said retaining means elastically deforming after a predetermined displacement to release said hammer from said initial retention position for impact against said piezoelectric means, said retaining means being defined by said rod, said body, said pulsator and said hammer.

4,153,853

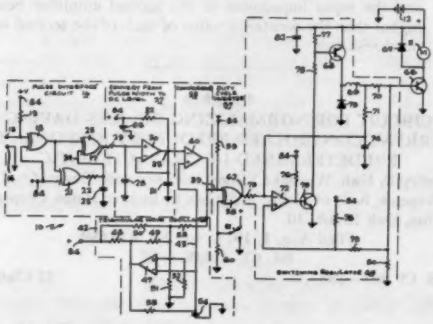
DC MOTOR SPEED CONTROLLER

Dail A. De Villeneuve, 11525 Rochester St., Los Angeles, Calif. 90035

Filed Jul. 7, 1976, Ser. No. 703,171

Int. Cl.[2] H02P *5/40*

U.S. Cl. 318—341 **5 Claims**



1. An electronic speed control for a dc motor comprising:

first means for developing a dc signal having a level proportional to the desired speed of said motor,

second means for producing a digital signal having a duty cycle proportional to said dc signal level, and

third means for switching voltage from a dc source to said motor for the on time of said duty cycle comprising;

a power transistor connected in series with said dc voltage source and said motor,

a switching regulator connected between said dc voltage source and the base of said power transistor, said switching regulator being gated on by said digital signal to turn on said power transistor for the on time of said duty cycle, and

control means for controlling the switching time ratio of said switching regulator in response to the sensed base current and the separately sensed base-to-emitter voltage drop of said power transistor, said switching regulator dropping voltage from said dc source to a level commensurate with the base-to-emitter voltage drop of said power transistor, said control means causing said switching regulator to provide sufficient base current to said power transistor so as to cause fully saturated digital switching thereof.

4,153,854

RADIOLUSCENT WINDOW STRUCTURES

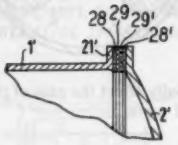
Hermann Christgau, Fuerth, and Ulrich Bodes, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,662

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619293

Int. Cl.[2] **H01J** *39/02;* **B23K** *31/02*

U.S. Cl. 313—101 **8 Claims**



1. A radiouluscent window structure comprised of an aluminum pane bonded to a metal frame via a substantially gas-impermeable seal comprising a first nickel layer in contact with respective outer edge surfaces of said frame, a second nickel layer in contact with respective outer edge surfaces of said pane, and a silver layer in contact with said first and second nickel layers.

4,153,855

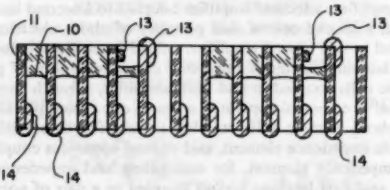
METHOD OF MAKING A PLATE HAVING A PATTERN OF MICROCHANNELS

Robert M. Feingold, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 16, 1977, Ser. No. 861,139

Int. Cl.[2] **B05D** *3/06*

U.S. Cl. 313—105 CM **3 Claims**



1. A method of treating an unetched microchannel plate to produce a microchannel plate having a pattern of channels, the method including the steps of:

applying a mask to one side of said unetched microchannel plate in accordance with said pattern:

etching the cores not covered by said mask to produce channels;

metallizing the channels and the mask; and

stripping the mask.

4,153,856

PROXIMITY FOCUSED ELEMENT SCALE IMAGE DISPLAY DEVICE

Wieslaw W. Siekanowicz, Lawrenceville, and Thomas L. Credelle, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 16, 1977, Ser. No. 797,405

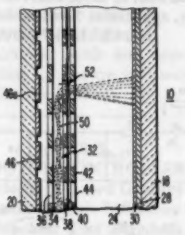
Int. Cl.[2] **H01J** *29/56, 29/80, 31/20*

U.S. Cl. 313—422 **8 Claims**

1. In a flat panel image display device having an envelope with spaced front and rear walls, a cathodoluminescent screen on the front wall, an electron beam guide within the envelope and means for extracting the electron beam at various points along the guide, the improvement wherein the guide comprises:

a first guide grid within the envelope spaced from and parallel to the rear wall for establishing a first electric field on the rear wall side of the guide, said first grid having a plurality of apertures therethrough;

a guide grid structure between the first guide grid and the screen for establishing a second electric field, stronger than said first field, on the screen side of the guide while maintaining symmetrical electron beam confining fields within the guide between the first guide grid and the guide grid structure; said guide grid structure including,



a second guide grid between the first guide grid and the front wall substantially parallel to the first guide grid, said second guide grid having a plurality of apertures extending therethrough,

a third guide grid between the second guide grid and the front wall substantially parallel to the second guide grid, the third guide grid being maintained at the same potential as the second guide grid and having a plurality of apertures therethrough; and

means for applying the same potential to the first guide and the grid structure.

4,153,857

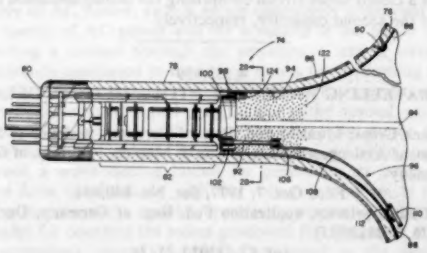
TELEVISION CATHODE RAY TUBE HAVING GETTER FLASH TOLERANT INTERNAL RESISTIVE ELEMENT

Dale Delsing, Evanston, and Mark Fogelson, Wilmette, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 6, 1977, Ser. No. 803,907

Int. Cl.[2] **H01C** *7/00;* **H01J** *29/84, 29/94*

U.S. Cl. 313—481 **14 Claims**



1. In a television cathode ray tube having a getter containing a vaporizable, electrically conductive, gas adsorptive getter material, the improvement comprising an electrically resistive element for arc suppression, internal voltage division, static elimination, RC signal coupling or the like, said resistive element being composed of a high resistivity material compatible with a clean, high-vacuum environment, said element being so widely and deeply cavitated and contorted at and below its nominal surface that the real surface of the element is shad-

owed and very greatly extended in area relative to the nominal surface of the element, having the effect that when the getter is flashed, the coating of conductive getter material deposited on the element is effectively dispersed and fragmented into isolated conductive islands, the result of which is to render tolerably insignificant the tendency of arc currents to travel over the surface of the element and thereby by-pass the body of the element.

4,153,858

DEMAGNETIZATION ARRANGEMENT

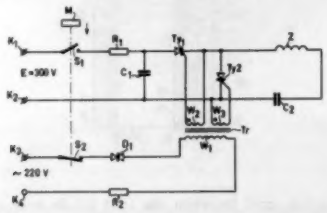
Erik C. Schylander, Stockholm, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 5, 1978, Ser. No. 867,012

Claims priority, application Sweden, Jan. 14, 1977, 7700356

Int. Cl.[2] H01F *13/00*

U.S. Cl. 315—8 **14 Claims**



1. A circuit arrangement for the demagnetization of colour television receivers by means of a time decreasing A.C. current through a demagnetization coil disposed on the colour picture tube, said circuit comprising a first capacitor, first switch means for coupling the capacitor to a D.C. current source in a time interval immediately before the demagnetization during a sufficiently extended time for charging the capacitor and for thereafter uncoupling said capacitor from said D.C. current source, second switch means for coupling the capacitor across the demagnetization coil in a time interval after the charging of said capacitor and after said uncoupling of said capacitor from the D.C. current source for producing a train of current pulses alternatingly occurring with a different direction and an amplitude decreasing with respect to zero as a result of the discharge of the capacitor through the coil, and a second capacitor having a smaller value than said first capacitor coupled in series with the demagnetization coil, said second switch means alternatively forming a closed series circuit comprising the first capacitor, the demagnetization coil, and the second capacitor, and a closed series circuit comprising the demagnetization coil and the second capacitor, respectively.

4,153,859

TRAVELLING WAVE TUBE WITH A HELICAL DELAY LINE

Franz Gross, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

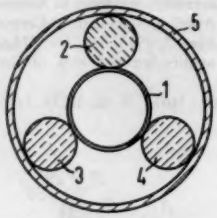
Filed Oct. 7, 1977, Ser. No. 840,494

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1976, 7638159[U]

Int. Cl.[2] H01J *25/34*

U.S. Cl. 315—3.5 **3 Claims**

1. A travelling-wave tube with improved heat dissipation characteristics, having a helical delay line disposed between an electron-beam generating system and an electron-beam receiver, with the helix being supported by three retaining rods made of dielectric material extending parallel thereto, one of said retaining rods being made of a material different from that of the remaining rods, said remaining rods being constructed of quartz, while the firstmentioned different kind of rod is constructed of a material that has a better heat conducting capacity than the quartz rods, at least in a radial direction, and has a dielectric constant which does not differ sufficiently from that



of quartz to materially effect the gain of the tube or dispersion curve of the signal wave.

4,153,860

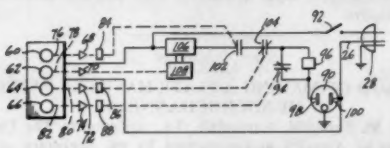
LIGHTING CONTROL APPARATUS

Frederick Vonick, 131 Orange Turnpike, Sloatsburg, N.Y. 10974

Filed Aug. 17, 1977, Ser. No. 825,236

Int. Cl.[2] H05B *37/02*; H01H *47/24*

U.S. Cl. 315—155 **1 Claim**



1. A lighting control apparatus comprising a housing, a plurality of openings in said housing, a plurality of photo electric cells disposed in said housing located behind said plurality of openings, a first amplifier coupled to a first latching circuit, a first one of said plurality of photo electric cells coupled to said amplifier, a second amplifier coupled to a second latching circuit, a second one of said plurality of photo electric cells coupled to said second amplifier, a third amplifier coupled to a third latching circuit, a third one of said plurality of photo electric cells coupled to said third amplifier, a fourth amplifier coupled to a control apparatus, a fourth one of said plurality of said photo electric cells coupled to said fourth amplifier, a variable impedence element, said control apparatus coupled to said impedence element, for controlling said impedence element, said first latching circuit coupled to a pair of normally open contacts, said second latching circuit coupled to a first pair normally closed contacts, said third latching circuit coupled to a second pair of normally closed contacts, a flasher, a receptacle, said receptacle having a pair of terminals, a switch, said switch having a first and a second pole, a plug, said plug having a pair of terminals, a line cord, said cord having a first and a second electrical conductor, said pair of terminals of said plug individually coupled to said first and said second conductor of said line cord at one end of said line cord, said first conductor coupled to said first pole of said switch at the other end of said line cord, the end of said second conductor located at said other end of said line cord coupled to one of said terminals of said receptacle, said second pole of said switch coupled to one terminal of said impedence, the other terminal of said impedence coupled to one contact of said normally open contacts, the other contact of said normally open contacts coupled to one terminal of said first normally closed contacts, the other terminal of said first normally closed contacts coupled to a junction of the first terminal of said second normally closed contacts and one terminal of said flasher, the other terminal of said second normally closed contacts and the other terminal of said flasher coupled to the other terminal of said receptacle, means for said fourth amplifier driving said control apparatus, means for said control apparatus varying the imped-

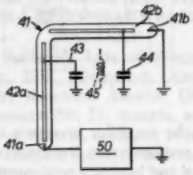
ence of said variable impedence element said first and said second and said third latching means for latchingly operating said normally open contacts and said first and said second normally closed contacts into an opposite state upon the appearance of light in selected said openings of said housing.

4,153,861

ELECTRIC DISCHARGE TUBE APPARATUS

Arthur R. Warner, 11, Portsmouth Rd., Kingston-upon-Thames, Surrey, and Derrick A. Ward, 1 High Beech, Croham Manor Rd., South Croydon, Surrey, both of England

Filed Oct. 17, 1977, Ser. No. 842,489
Int. Cl.[2] H01J *11/04, 13/48, 15/04, 17/36*
U.S. Cl. 315—355 **15 Claims**



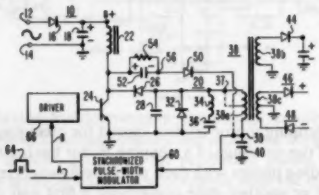
1. A gas-discharge tube apparatus comprising an elongate gas-discharge tube including an elongate tubular envelope containing an inert gas at low pressure, said envelope having at one end thereof an internal electrode that is brought out to a terminal external to the tube, said terminal being connected to one output terminal of a voltage generator arranged to develop a progressively varying high-frequency voltage, said tube having associated therewith and extending lengthwise of said envelope an elongate external electrode connected to the other output terminal of said generator by way of a reactance.

4,153,862

SELF-REGULATING DEFLECTION CIRCUIT WITH RESISTIVE DIODE BIASING

Chong C. Lim, Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 897,031
Int. Cl.[2] H01J *29/70*
U.S. Cl. 315—408 **7 Claims**



1. A self-regulating deflection circuit adapted to be energized from a source of unregulated direct voltage, said deflection circuit including

first inductance means;

controllable switch means including a unidirectional main current conducting path and a control electrode, said main current controlling path being serially coupled with said first inductance means across the source of unregulated direct voltage thereby forming a first series path for storing energy in said first inductance means during those intervals in which said main current conducting path is conductive;

first rectifier means;

a parallel combination of elements coupled by said first rectifier means across said main current conducting path, said parallel combination including second inductance means, damper diode means and retrace capacitance means, said first rectifier means being poled for current conduction in the same direction as said main current conducting path;

control means coupled with said second inductance means and with said control electrode for recurrently switching said main current conducting path for promoting current flow in said second inductance means during recurrent trace and retrace intervals and for maintaining the peak value of said current flow at a constant level;

second capacitance means;

second rectifier means coupled by said capacitance means with said parallel combination of elements and to a point on said first series path for transferring energy from said first inductance means to said parallel combination of elements during said retrace intervals;

wherein the improvement comprises

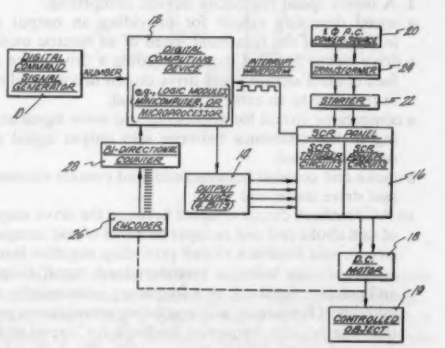
resistance means coupled with said second capacitance means for equalizing charge on said second capacitance means during said trace interval.

4,153,863

DC MOTOR CONTROLLER

John J. Schachte, Charlotte, N.C., and Geoffrey A. Ross, Canton Center, Conn., assignors to Colt Industries Operating Corp. (Pratt & Whitney Machine Tool Division), West Hartford, Conn.

Filed Apr. 20, 1977, Ser. No. 789,532
Int. Cl.[2] G05B *5/01*
U.S. Cl. 318—341 **1 Claim**



1. In a digital DC motor control device of the type having a source of AC power; switch means operatively connected to the source of AC power and the armature of the motor for directing a current through the armature; a trigger circuit operatively connected to the switch means for the turning on thereof; a digital command signal generator for generating a numerical command signal proportional to the desired motor speed; an encoder operatively connected to the motor for generating pulses having a frequency proportional to the speed thereof; a wave-shaping circuit for generating an interrupt wave form synchronized with the voltage waveform of the AC power source; a counter operatively associated with the encoder for counting the pulses generated thereby; and a digital computing device operatively connected to the digital command signal generator for receiving the numerical command signal, operatively connected to the wave-shaping circuit for receiving the interrupt wave form, operatively connected to the counter for periodically sampling the number therein and operatively connected to the trigger circuit for activation thereof, the digital computing device being adapted to compute desired firing angles for the switch means in accordance with the numerical command signal applied thereto; the improvement in the digital computing device comprising:

means to compute limit forward and reverse firing angles for

a given motor speed, the limit firing angles being known to produce maximum acceptable armature currents; and

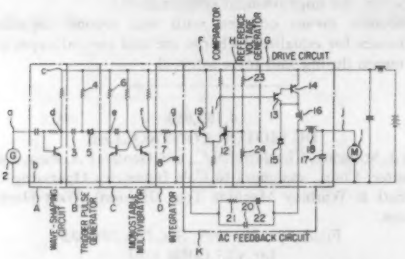
means to compare a computed desired firing angle with a computed limit firing angle for providing a calculated firing angle which will not engender excessive armature currents which could cause arcing or demagnetization.

4,153,864

MOTOR SPEED REGULATOR

Hiroshi Minakuchi, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 5, 1977, Ser. No. 839,497
Claims priority, application Japan, Oct. 13, 1976, 51-123063
Int. Cl.[2] H02P *5/06*
U.S. Cl. 318—341 **11 Claims**



1. A motor speed regulating device, comprising:

a speed detecting circuit for providing an output signal indicative of the rotational speed of an electric motor;

a drive circuit for said motor including a drive stage and a feed control element, said drive circuit driving said motor in response to an error control signal;

a comparator circuit for generating said error signal according to the difference between said output signal and a reference signal;

a choke coil coupled between said feed control element and said drive stage; and

an AC feedback circuit coupled between the drive stage side of said choke coil and an input terminal of said comparator circuit, said feedback circuit providing negative feedback at frequencies below a predetermined cutoff frequency and positive feedback at a frequency substantially above said cutoff frequency, said regulating arrangement providing negative low frequency feedback for circuit stabilization and positive high frequency feedback to generate oscillations for periodically supplying drive current to said motor.

4,153,865

DYNAMICALLY COMPENSATED SERVO MONITOR

Richard L. Cohen, Matawan, and Richard J. Anderson, Fairfield, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Jun. 27, 1977, Ser. No. 810,212
Int. Cl.[2] G05B *23/02*
U.S. Cl. 318—565 **5 Claims**

1. In monitoring apparatus for a servo system wherein the tolerance of the monitoring apparatus corresponds to the static offset error and the velocity lag error of the system, means for dynamically compensating the monitoring apparatus for the velocity lag error comprising;

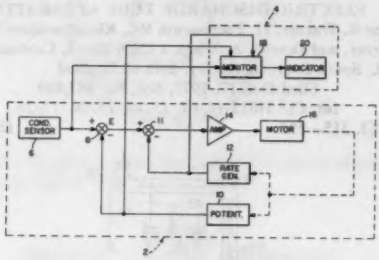
means for providing a command signal;

means for providing a position feedback signal;

means for combining the command and position feedback signals for providing an error signal;

means for providing a rate feedback signal; and

the monitoring apparatus including means responsive to the error signal and the rate feedback signal for providing a monitoring signal which is compensated for the velocity lag error, said means including an amplifier having an inverting input terminal, a non-inverting input terminal and an output terminal, the means for combining the command and position feedback signals for providing an error signal connected to the amplifier non-inverting input terminal, the means for providing a rate feedback signal



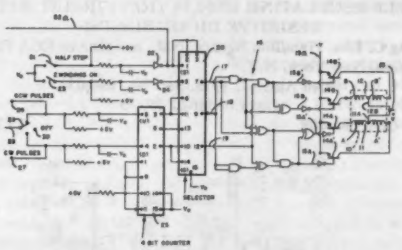
connected to the amplifier inverting input terminal, and the amplifier responsive to the error signal and the rate feedback signal and having a predetermined gain in accordance with the quotient of the velocity lag error divided by the rate feedback means signal for providing at the amplifier output terminal the monitoring signal which is compensated for the velocity lag error.

4,153,866

PULSE TO STEP STEPPING MOTOR CONTROL CIRCUIT

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed May 16, 1977, Ser. No. 797,150
Int. Cl.[2] H02K *37/00*
U.S. Cl. 318—696 **10 Claims**



1. A stepping motor control circuit for changing the energization of the windings of a stepping motor having two energizable winding phases with each phase being energizable to have one state or another state comprising a first pair of switching devices connected to the one phase and having conditions for energizing or non-energizing the one state and for energizing or non-energizing the other state, a second pair of switching devices connected to the second phase and having conditions for energizing or non-energizing the one state and for energizing or non-energizing the other state, means connected to receive command pulses and change one condition of one of the switching devices for each command pulse received with the changes following a repeating plural step sequence with there being a first sequence causing only one switching device to have an energized condition for each step, a second sequence in which both switching devices have an energized condition for each step and a third sequence in which one and both switching devices alternately have an energized condition for each step and means for selecting one of the sequences for the changes to follow and in which the control circuit includes oscillator means for generating pulses and means for receiving

said pulses and supplying command pulses to the means for receiving command pulses and in which the supplying means includes means connected to the selecting means for supplying every other generated pulse as a command pulse when the first and second sequences are selected and every generated pulse when the third sequence is selected.

4,153,867

DEVICE FOR DETERMINING THE CHARGE CONDITION FOR A SECONDARY ELECTRIC STORAGE BATTERY

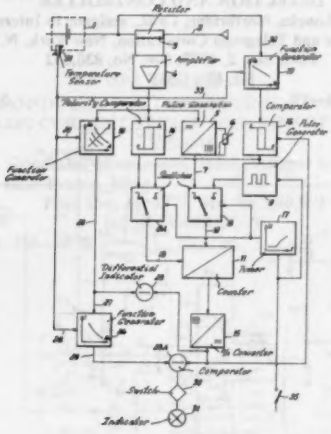
Leopold Jungfer, deceased, Late of Klagenfurt, Austria; by Helmut Jungfer, heir, Klagenfurt, Austria; by Ingeborg Meyenburg, heir, Rosental, Austria; Dieter Kautschitsch, Feistritz im Ronsental Nr. 31, Austria, and Richard Weber, Klagenfurt, both of Austria, assignors to Akkumulatoren-fabrik Dr. Leopold Jungfer, Feistritz im Rosental, Austria

Filed Nov. 14, 1977, Ser. No. 851,346

Claims priority, application Austria, Nov. 16, 1976, 8515/76

Int. Cl.[2] H02J 7/10; H01N 27/42

U.S. Cl. 320—43 **4 Claims**



1. In a device for determining the charge condition of a secondary electric storage battery and including an integrator comprising a pulse generator for producing pulses at a frequency which can be varied in accordance with the magnitude of a load current driven by the battery, and an up-down counter for counting the pulses from the pulse generator in a sense dependent upon the battery current direction, the improvement comprising an adjusting pulse generator, switch means for selectively coupling said first-mentioned pulse generator or said adjusting pulse generator to the up-down counter, a function generator programmable in accordance with the relationship between no-load voltage, temperature and charge condition of the battery concerned to generate a signal representing the charge condition associated with a particular detected no-load voltage and temperature, and a comparator connected to receive and to compare the said signal from the function generator, and a signal representing the counter setting, and to control the supply of pulses to the up-down counter and the sense of counting therein, when the adjustment pulse generator is coupled thereto, in accord with the result of the comparison.

4,153,868

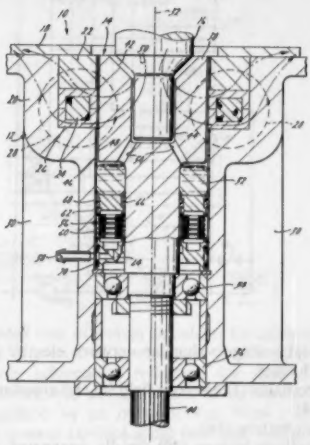
UNIPOLAR DYNAMOELECTRIC MACHINE WITH VARIABLE RESISTANCE CONTROL

Adam M. Janotik, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1977, Ser. No. 863,100

Int. Cl.[2] H02P 9/00

U.S. Cl. 322—48 **11 Claims**



1. A unipolar dynamoelectric machine with variable resistance control of machine current, said machine comprising:

a stator comprising a housing and a field coil said stator having an opening within it defining an axis and said field coil being helically wound and concentrically positioned with respect to said axis, said housing being made from a ferromagnetic and electrically conductive material in its portion near said field coil;

a rotor journalled for rotation within said stator opening and about said axis, said rotor including a ferromagnetic and electrically conductive portion;

a control member made from a material having some electrical resistance, said rotor portion rotating about said control member when said rotor rotates about said axis, said rotor portion being located between said control member and said housing portion, a first annular space being formed between said control member and said rotor portion, a second annular space being formed between said housing portion and said rotor portion, said first and second annular spaces being concentric about said axis, said second annular space being located radially outward of said first annular space;

a liquid metal stored within said machine in a cavity therein defined at least in part by said stator and said rotor, and

means for forcing said liquid metal to enter said first and second annular spaces, thereby , to provide electrical contact between said control member and said rotor portion and between said rotor portion and said stator.

4,153,869
DUAL VOLTAGE NETWORK ELECTRICAL POWER SUPPLY SYSTEM, PARTICULARLY FOR AUTOMOTIVE VEHICLES

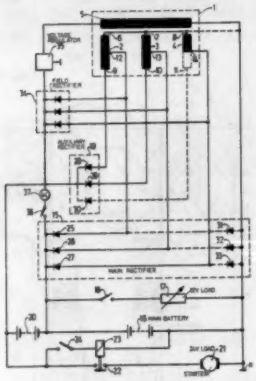
Istvan Ragily, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 838,635

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 2650851

Int. Cl.[2] **H02J** *7/14*

U.S. Cl. 322—90 **12 Claims**



1. Dual voltage vehicular network electric power supply system having

an alternator (1) having a field (5) and armature windings (2, 3, 4)

a main battery (16);

an auxiliary battery (20) serially connected with the main battery;

and a main rectifier (15),

and comprising an auxiliary rectifier (19);

taps (12, 13, 14) connected to the armature windings (2, 3, 4) of the alternator (1);

and wherein the main rectifier (15) is connected to said tap points (12, 13, 14) of the alternator (1) and to charge said main battery, and the auxiliary rectifier is connected to the end terminals (9, 10, 11) of the armature windings (2, 3, 4) of the alternator (1) and to charge said auxiliary battery.

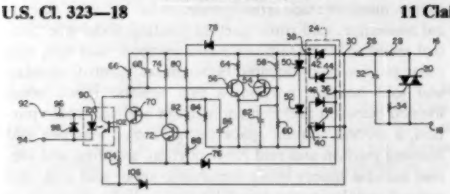
4,153,870
INTEGRAL CYCLING RELAY

Michael D. Sidman, Malden, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 667,712, Mar. 17, 1976, abandoned. This application Sep. 9, 1977, Ser. No. 831,857

Int. Cl.[2] **G05F** *3/04*

U.S. Cl. 323—18 **11 Claims**



11. In an integral-cycling, zero-axis firing relay circuit for controlling the application of an AC signal from a power source to a load, said power source and said load being suitably coupled to system ground, said circuit comprising bidirectional switching means, responsive to a control signal, for selectively coupling said source to said load, and control means for applying said control signal to said switching means in response to a trigger signal, said switching means being only conductive, once rendered conductive, during full alternative half cycles of the voltage of said AC signal, the improvement comprising:

said control means including memory means for storing a portion of electrical energy from said power source only during the first half cycle of each full cycle when said switching means is nonconductive and for discharging said energy during each subsequent half cycle so that said switching means is maintained nonconductive and can only be placed in a conductive state commencing at the beginning of a full alternate half cycle, said circuit further including a pair of terminals for electrically coupling said circuit to said source and said load, wherein said control means provides integral cycling, zero-axis firing between said terminals, wherein said memory means further includes means for determining when the instantaneous voltage across said terminals is substantially zero, and detection means for detecting the polarity of the instantaneous voltage.

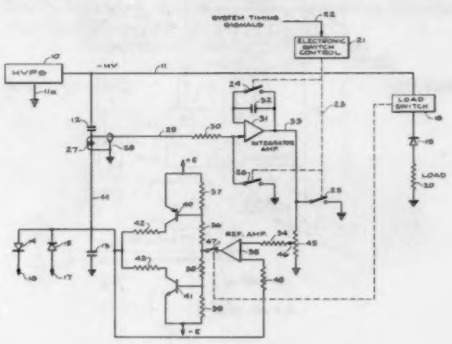
4,153,871
IMPLICIT PULSE-TO-PULSE HIGH VOLTAGE DETECTION AND CONTROLLER

Richard S. Loucks, Northridge, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,082

Int. Cl.[2] **G05F** *5/00*

U.S. Cl. 323—19 **9 Claims**



1. A direct current high voltage power supply regulation system particularly adapted for pulsed load applications comprising:

a source of incompletely regulated high voltage feeding a load through a pulsing control switch;

a first capacitor having a first terminal connected to said source of high voltage;

a second capacitor having a first terminal connected to the second terminal of said first capacitor, the second terminal of said second capacitor being connected to the return terminal of said source;

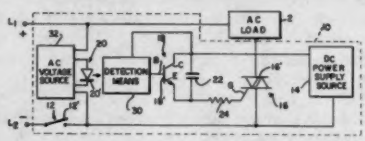
first means responsive to an electrical current flowing in the connection between said first and second capacitors to develop a first signal as a function of said current and which is the analog of said high voltage at said first capacitor first terminal;

and second means for developing a bootstrap voltage as a function of said first signal and for applying said bootstrap voltage across said second capacitor, the algebraic sum of the voltage across said first and second capacitors being said high voltage in regulated form.

4,153,872
CREST FIRING MEANS

Daniel I. Pomerantz, Lexington, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jun. 16, 1977, Ser. No. 807,010
Int. Cl.[2] G05F 3/04
U.S. Cl. 323—21 16 Claims

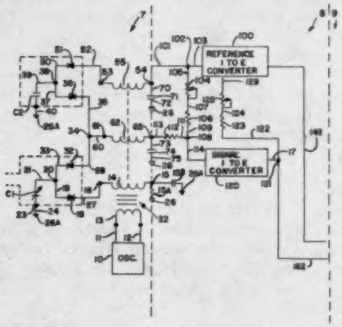


1. A crest firing means for applying power to a load at a voltage crest of an alternating reference signal comprising: a light emitting device having a threshold point at which it emits a light pulse indicative of said voltage crest of said alternating reference signal, detection means responsive to said light pulse emitted by said light emitting device, and activating means responsive to said detection means for activating said load at said voltage crest of said alternating reference signal.

4,153,873
TRANSDUCER FOR CONVERTING A VARYING ANALOG CURRENT SIGNAL TO A BINARY DIGITAL SIGNAL

Earl A. Grindheim, Minneapolis, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Oct. 11, 1977, Ser. No. 840,653
Int. Cl.[2] G01R 27/26
U.S. Cl. 324—60 R 14 Claims

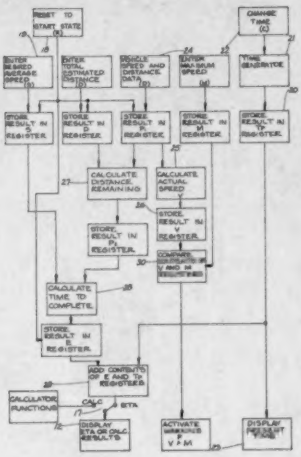


1. A transducer having a digital output comprising first means to sense a parameter and provide a first DC analog signal representative of said parameter, analog to digital conversion means, second means coupled to said first means to provide said first DC analog signal to said analog to digital conversion means, third means coupled to said analog to digital conversion means to provide a second reference DC analog signal representative of the first DC analog signal at a reference condition of said parameter, said analog to digital conversion means including fourth means to correlate said first DC analog signal and said second reference DC analog signal and to provide a digital indication of the value of said first DC analog signal with respect to said second reference DC analog signal.

4,153,874
MOBILE PERPETUALLY SELF-CORRECTING ESTIMATED TIME OF ARRIVAL CALCULATOR

Erwin A. Kaestner, 5300 Hamilton Ave., Cincinnati, Ohio 45224

Filed Aug. 26, 1977, Ser. No. 827,884
Int. Cl.[2] G01P 3/56
U.S. Cl. 324—161 7 Claims



1. An estimated time of arrival calculator for computing the estimated time of arrival of a vehicle or the like at a desired destination from information reflecting the total estimated distance and the desired average speed to be travelled to the destination supplied by an operator and from information reflecting the present chronological time and the actual distance travelled by the vehicle, the calculator comprising:

(a) memory means having a plurality of storage locations for storing digital information;

(b) means for entering into said memory means the information reflecting the total estimated distance and the desired average speed to be travelled to the destination;

(c) clock means for generating information reflecting the present chronological time;

(d) calculating means responsive to said memory means and said clock means for computing the estimated time of arrival at the destination from information reflecting the total estimated distance to the destination, the desired average speed, the actual distance travelled and the present chronological time; and

(e) means responsive to said calculating means for displaying the estimated time of arrival.

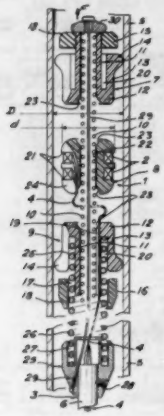
4,153,875
EDDY-CURRENT TESTING DEVICE FOR METAL TUBES WHICH ARE BENT AT LEAST LOCALLY

Michel Pigeon, Bures sur Yvette, and Claude Vienot, Fontenay-sous-Bois, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 29, 1976, Ser. No. 709,946
Claims priority, application France, Aug. 7, 1975, 75 24698
Int. Cl.[2] G01R 33/14
U.S. Cl. 324—220 11 Claims

1. An eddy-current testing device for metal tubes bent at least locally so that an inner radius of curvature has a greater thickness than the outer radius of curvature and having a given internal diameter, said device operating by translational motion of a probe within the interior of said tubes, the probe being provided with an emitter-receiver coil and with an electric cable having conductors connected to said coil and coupled mechanically to the probe in such a manner as to accompany said probe in its translational motion while continuously

emerging from the rear end of the tube in order to remain connected to a supply and scanning system located outside said tube, wherein the probe comprises successively from front to rear in the direction of normal translational motion thereof a front guiding member, a coil-carrying member and a rear guiding member, said front and rear guiding members having an outer diameter substantially equal to said internal diameter, and elastic means, said members being connected together by



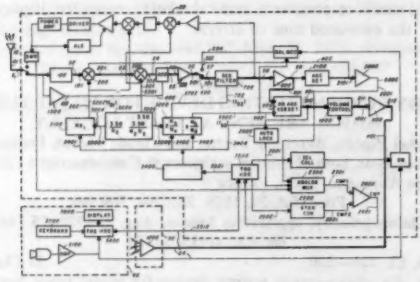
said elastic means which tends to align said three members, said coil carrying member having maximum transverse dimensions which are so much smaller than said given internal diameter and said front and rear guiding members being so spaced from said coil-carrying member, that in movement around curved portions of said tube the coil-carrying member is displaced toward the inner radius of curvature of the portion and the impedance of said coil remains substantially constant, the cable being connected mechanically to the rear guiding member.

4,153,876

CHARGE TRANSFER DEVICE RADIO SYSTEM

Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1977, Ser. No. 791,614
Int. Cl.[2] H04B *1/40*
U.S. Cl. 325—15 **4 Claims**



1. A transceiver comprised of:

(a) first mixer means having inputs coupled to simultaneously receive (1) input signals comprised of a plurality of non-overlapping frequency channels and (2) mixing frequency signals of a second selectable frequency, for generating in response thereto, output signals in which said input signal is shifted in frequency such that the center frequency of a selected one of said frequency channels is shifted to a predetermined frequency;

(b) change transfer device filter means coupled to said mixer means for defining a frequency range of said output signals around said predetermined center frequency to filter out all but said selected one of said frequency channels;

(c) demodulator means having an input coupled to said filter and coupled to receive first clocking signals of a first selectable frequency for demodulating said selected one frequency channel;

(d) first transducer means coupled to said demodulator means for converting said demodulated frequency channel into audible sound;

(e) second transducer means for converting audible sound into information signals;

(f) modulator means having inputs coupled to said second transducer means for receiving said information signals and coupled to receive first clocking signals of said first selectable frequency for modulating said information signals in response to said first selectable frequency;

(g) switch means selectively coupling said first mixer means and said modulator means to said filter means;

(h) second mixer means having inputs coupled to simultaneously receive (1) input signals from said filter and (2) mixing frequency signals of second selectable frequency, for generating in response thereto, output signals in which said input signal is shifted in frequency such that the center frequency of the filtered frequency channel is shifted to a predetermined frequency;

(i) mixing frequency generator means having inputs coupled to receive digital coded microcommands identifying a selectable mixer frequency for generating said second frequency to said first and second mixer means in response thereto;

(j) filter clocking generator means having inputs coupled to receive digital coded microcommands identifying a selectable filter clocking frequency for generating filter clocking signals of a selectable filter clocking frequency to said filter means in response thereto;

(k) modulator/demodulator clocking means having inputs coupled to receive digital microcommands and outputs coupled to said modulator means and to said demodulator means for generating said first clocking signals thereto; and

(l) digital processor means having outputs coupled to said mixing frequency generator means, said filter clocking means and said modulator/demodulator clocking means for sending said digital microcommands to select various channels from said plurality.

4,153,877

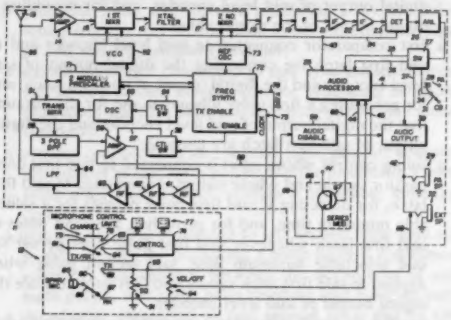
MOBILE CB TRANSCEIVER

George H. Fathauer, and Wayne L. Holst, both of Mesa, Ark., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Feb. 13, 1978, Ser. No. 877,448
Int. Cl.[2] H04B *1/40*
U.S. Cl. 325—25 **27 Claims**

15. A multichannel mobile CB radio system adapted to be operatively installed in a motor vehicle comprising a transceiver means adapted to be mounted in a remote location on the motor vehicle such as in the trunk, behind the dashboard, under the seat, or the like, and a hand-held combination microphone and control unit mounted for easy access to the operator of the CB radio system, said hand-held microphone and control unit including housing means of a size so as to be capable of being held in the vehicle operator's hand, microphone means for converting audio sound signals into audio electrical signals for transmission purposes, and control means; said control means including (a) memory means for storing a plurality of multibit digital words each of which corresponds to a predetermined discrete radio channel frequency; (b) channel selection means for selecting a predetermined one of said plurality of stored digital words; and (c) means for serially trans-

mitting the individual bits of said selected stored digital word to said remotely located transceiver means; and said transceiver means including a radio transmitter means; a radio receiver means; and a frequency synthesizer means including a phase-locked loop circuit means for generating and maintaining said predetermined selected radio channel frequency, said phase-locked loop circuit means including (a) means for serially receiving and temporarily storing said selected digital word transmitted by said control means, (b) counter means responsive to one or more bits of said temporarily stored digital word for establishing an initial count number and being operable for controllably counting up or down therefrom, (c)



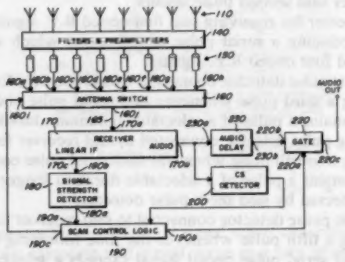
means for generating a predetermined reference frequency, (d) phase comparator means having a first input coupled for receiving said generated predetermined reference frequency, a second input, and an output for generating a phase detection control signal, (e) a voltage-controlled oscillator responsive to said generated phase detection control signal for outputting a precisely controlled radio channel frequency signal to said radio transmitter means, and (f) means responsive to the output of said voltage-controlled oscillator for controlling the counting of said counter means from said initially stored number and for outputting a programmed channel frequency control signal to the second input of said phase comparator means for completing the phase-locked loop control circuit.

4,153,878

SECTORED ANTENNA COMMUNICATIONS RECEIVER WITH SQUELCH CIRCUIT

James L. Osborn, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1977, Ser. No. 792,943
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—370 **5 Claims**



1. A squelch circuit adapted to receive and process an input signal containing an information signal preceded and/or followed immediately by a noise signal, comprising:

detector means for detecting the presence of an information signal and producing a control signal in response thereto, said detector means exhibiting a predetermined first delay between the time of receiving an information signal and the production of said control signal and a predetermined second delay between the conclusion of said information and the cessation of said control signal, said first and second delays being approximately equal;

gating means having an input terminal, an output terminal and a control input terminal, the gating means responding to said control signal at its control input terminal to couple said input terminal to said output terminal;

means for coupling the detector means produced control signal to the control input terminal of said gating means; and

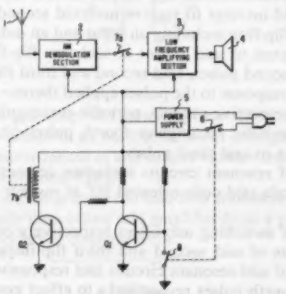
delay means for coupling said input signal to said gating means input terminal, the delay means providing a fixed overall delay to said input signal, which delay is approximately equal to said first and second delays of said detector means such that said input signal is passed to the output terminal of the gating means only for the duration of said information signal.

4,153,879

SHOCK MUTING CIRCUIT FOR USE IN AN AM RECEIVER

Kaku Sakaida, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1977, Ser. No. 822,944
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—478 **2 Claims**



1. In a radio receiver having (1) a signal transmission path extending from the antenna through the demodulation and low frequency amplifying sections to the speaker of the receiver and (2) a power switch which tends to spark when opened and radiate the sparks to said antenna, after which the sparks are transmitted over said transmission path to said speaker and emitted as shock noise, the improvement of a muting circuit for said shock noise, said muting circuit comprising

signal interrupting means for preventing a signal from said antenna from reaching said speaker in response to a control signal being applied to said signal interrupting means,

control signal generating means responsive to the initiation of the opening of said power switch for generating said control signal prior to the actual opening of said power switch so that said signal interruption means is actuated prior to the opening of said power switch to thereby prevent said shock noise from being emitted from said speaker.

4,153,880

METHOD AND APPARATUS FOR GENERATING A HIGH FREQUENCY ROTATING MAGNETIC FIELD

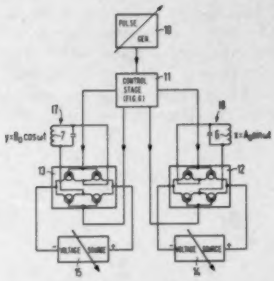
Franz Navratil, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 19, 1974, Ser. No. 534,426

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1974, 2414786

Int. Cl.[2] H03K *5/08;* **G11C** *11/02*

U.S. Cl. 328—27 **3 Claims**



1. Apparatus for generating a high frequency rotating magnetic field, comprising:

a pulse generator adjustable in its frequency for generating periodic first pulses;

a first flip-flop including an input and an output, said input connected to said pulse generator, and said first flip-flop responsive to said first pulses to generate periodic rectangular second pulses at said output;

an inverter connected to said output of said first flip-flop;

a second flip-flop including an input and an output, said input connected to said output of said first first flip-flop via said inverter to receive inverted second pulses, and a third flip-flop including an input and an output, said input connected to said output of said first flip-flop to receive said second pulses, said second and third flip-flops operable in response to the pulses applied thereto to generate, at their respective outputs, periodic rectangular third pulses and periodic rectangular fourth pulses phased 90° with respect to said third pulses;

a pair of resonant circuits including respective capacitors and coils said coils oriented 90° in respect of each other; and

a pair of switching amplifiers respectively connecting said outputs of said second and third flip-flops to respective ones of said resonant circuits and responsive to said third and fourth pulses respectively to effect generation of 90° phased sinusoidal currents which energize said coils to together produce the rotating magnetic field.

4,153,881

EARLY FLOOD WARNING SYSTEM

Alan R. Permut; Albert A. Permut, and Ronald M. Permut, all of 6995 Sweetwater Ct., Boulder, Colo. 80301

Continuation-in-part of Ser. No. 846,679, Oct. 31, 1977. This application Apr. 28, 1978, Ser. No. 900,906

Int. Cl.[2] G08B *25/00*

U.S. Cl. 325—64 **24 Claims**

1. An early flood warning system comprising:

a digital liquid level gauge for measuring the level of liquid in discrete increments at desired locations;

a plurality of level sensing electrodes in said digital liquid level gauge for providing possible electric current paths in conjunction with the current carrying capability of somewhat electrically conductive liquid in contact with said level sensing electrodes;

a means for mounting said level sensing electrodes in a spaced relationship to each other, and in a desired relationship to the liquid whose level is being measured;

a means for applying a voltage to said level sensing electrodes via liquid in contact with said level sensing electrodes and said voltage applying means;

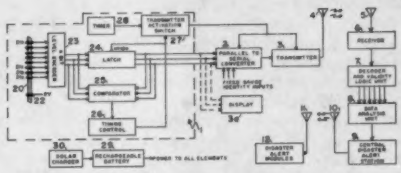
an n-bit level encoder connected to said level sensing electrodes for detecting which of said level sensing electrodes are in contact with said liquid whose level is being measured, and for generating a digital output which uniquely defines the uppermost of said level sensing electrodes in contact with said liquid;

a first latch connected to said level encoder for storing the digital output of said level encoder, and for providing a digital output of the stored value;

a first comparator connected to said level encoder and to said first latch for comparing the digital output of said level encoder and the digital output of said first latch, and for generating a first pulse whenever and for the duration that the digital output of said level encoder and the digital output of said first latch are unequal;

a timing control whose input is connected to said first comparator output and whose output is connected to said first latch, for detecting if said first pulse persists for a selectable minimum time, and for providing a second pulse to said first latch whenever said first pulse does persist for said selectable minimum time, said second pulse when applied to said first latch causes said first latch to store the digital output of said level encoder;

a parallel to serial converter connected to said first latch output for converting the parallel output of said first latch to a serial pulse coded sequence of repeating code frames,



each code frame consisting of a train of pulses and each code frame uniquely defining the parallel output of said first latch;

a transmitter connected to said parallel to serial converter for transmitting a first coded R.F. signal by R.F. carrier, representing said serial pulse coded sequence;

a transmitter activation switch connected to the output of said timing control, to said parallel to serial converter, and to said transmitter for activating said parallel to serial converter and said transmitter for a selectable time whenever said second pulse occurs;

a receiver for receiving said first coded R.F. signals and for producing a serial pulse coded signal which represents said first coded R.F. signal;

a short pulse detector connected to said receiver for producing a third pulse whenever said serial pulse coded signal contains a pulse of a selectable minimum duration;

a long pulse detector connected to said receiver for producing a fourth pulse whenever said serial pulse coded signal contains a pulse of a selectable duration longer than that detected by said short pulse detector;

a sync pause detector connected to said receiver for producing a fifth pulse whenever the time following a pulse in said serial pulse coded signal exceeds a selectable maximum time;

a serial to parallel converter connected to said short pulse detector and to said long pulse detector for converting the output of said short pulse detector and the output of said long pulse detector, said third and fourth pulses respectively, to a parallel digital output which uniquely represents said serial pulse coded signal;

a second latch connected to said serial to parallel converter

for storing the output of said serial to parallel converter, and for providing a digital output of the stored value;

a second comparator connected to said serial to parallel converter and to said second latch, for comparing the digital output of said serial to parallel converter and the digital output of said second latch, and for producing a sixth pulse whenever said digital output of said serial to parallel converter and the digital output of said second latch are equal;

a first logic gate connected to said sync pause detector, to said second comparator, and to said second latch for determining when said fifth pulse occurs in the absence of said sixth pulse, and for then producing a seventh pulse, which triggers said second latch to store the digital output of said serial to parallel converter;

a second logic gate connected to said sync pause detector, and to said second comparator, for producing an eighth pule when said fifth pulse and said sixth pulse occur simultaneously;

a counter connected to said second logic gate for counting the number of said sixth pulses, and for producing a tenth pulse when said counter reaches a selectable minimum count;

a time limit control connected to said second logic gate and to said counter for producing a ninth pulse if a minimum selectable time elapses between the occurences of said eigth pulses, said ninth pulse resetting said counter; and

a data buffer connected to said second latch and to said counter for storing the digital output of said second latch when said tenth pulse occurs, and for providing a digital output of the stored value.

4,153,882

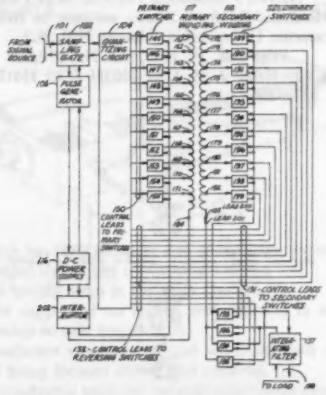
HIGH-EFFICIENCY AMPLIFIER

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec, Canada (H3R 1K3)

Filed Mar. 24, 1978, Ser. No. 889,897

Int. Cl.[2] H03F *3/38*

U.S. Cl. 330—10 **2 Claims**



2. Apparatus for amplifying a signal wave, comprising:

means for sampling said signal wave at a rate of twice the bandwidth of said signal wave in herz or greater, including a sampling gate driven by a source of regularly-occurring pulses, and

means for comparing and quantizing the amplitude of each sample of said signal wave with reference to a sequence of predetermined amplitudes, which form a geometric progression, and

means, associated with said comparing and quantizing means, for applying a potential to a selected combination of

leads of a plurality of control leads, for each of said signal samples, the selected combination of control leads being different for each of said predetermined amplitudes, that combination being selected for the predetermined amplitude closest to the amplitude and polarity of each said signal sample, and

a plurality of switching means, each being controlled by one of said control leads, some of said plurality of switching means being interposed between a direct-current power supply and a transformer with a winding or windings tapped in geometric ratios, and some of said switching means being interposed between said transformer and integrating means, and

said integrating means, comprising filter means, functioning to integrate said pulses at said transformer output to produce an amplified replica of said input signal wave, and

a load circuit connected to the output of said integrating means.

4,153,883

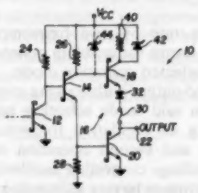
ELECTRICALLY ALTERABLE AMPLIFIER CONFIGURATIONS

David L. Taylor, and Stephen A. Harris, both of Melbourne, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Dec. 16, 1977, Ser. No. 861,331

Int. Cl.[2] H03F *3/26*; B01J *17/00*

U.S. Cl. 330—262 **32 Claims**



1. In a push-pull amplifier having phase splitting means, a first transistor means in an emitter follower configuration and a second transistor means in a common emitter configuration, the improvement comprising:

electrically alterable means in said first transistor means for permanently converting said amplifier from a push-pull to an open-collector configuration.

4,153,884

FREQUENCY SYNTHESIZER FOR TRANSMITTER/RECEIVER USING A PHASE LOCKED LOOP

Shigehiko Ikeguchi, and Norio Yamashita, both of Oora, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi and Tokyo Sanyo Electric Co. Ltd., Oora, both of, Japan

Division of Ser. No. 746,707, Dec. 2, 1976. This application Sep. 1, 1978, Ser. No. 938,829

Claims priority, application Japan, Dec. 16, 1975, 50/15040

Int. Cl.[2] H03B *3/04*

U.S. Cl. 331—1 A **8 Claims**

1. A frequency synthesizer for providing an oscillation frequency signal, said signal being in at least one of first and second variable frequency ranges; said frequency synthesizer comprising

voltage controlled oscillating means for providing an oscillation frequency signal the oscillation frequency of which is variable as a function of a given control voltage,

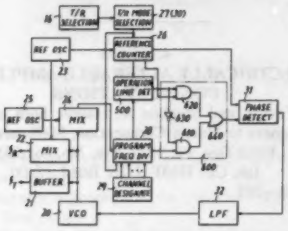
means for modifying the oscillation frequency of the output from said voltage controlled oscillating means,

means for controlling the rate of frequency modification of said oscillation frequency modifying means,

means responsive to the output from said oscillation frequency modifying means, as modified at the frequency modification rate controlled by said frequency modification rate controlling means, for providing a control voltage associated with the frequency of the output from said oscillation frequency modifying means to said voltage controlled oscillating means, whereby said frequency synthesizer is adapted to provide an oscillation frequency signal the frequency of which is associated with the frequency modification rate, as controlled by said frequency modification rate controlling means,

means for selecting a first operation mode for providing a frequency within said first variable frequency range or a second operation mode for providing a frequency within said second variable frequency range,

means responsive to the output from said mode selecting means for accommodating the control of the frequency



modification rate by said frequency modification rate controlling means for enabling generation of the frequencies in the selected operation mode,

first and second output withdrawing means responsive to the output from said mode selecting means for selectively withdrawing an oscillation frequency signal in the selected first and second operation modes, respectively, from said voltage controlled oscillating means,

first detecting means having a detection point in the vicinity of the operation limit of said oscillation frequency modifying means and for detecting the oscillation frequency of said voltage controlled oscillating means having reached said detection point, and

means responsive to the detected output from said first detecting means for correcting the control voltage from said control voltage providing means such that the oscillation frequency from said voltage controlled oscillating means may be a frequency within the stabilized operation region of said oscillation frequency modifying means.

4,153,885

MICROWAVE EQUALIZER WITH COAXIAL CABLE RESONANT STUBS

Helmut Bacher, 3301 Homestead Rd., Santa Clara, Calif. 95051

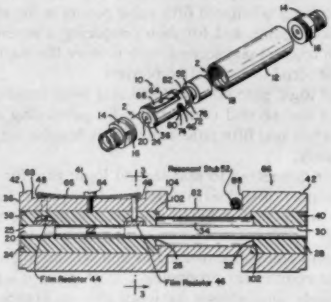
Filed May 23, 1977, Ser. No. 799,669
Int. Cl.[2] H01P *1/20, 1/22;* **H03H** *7/14*
U.S. Cl. 333—28 R **13 Claims**

1. In a microwave equalizer of the type which exhibits a frequency band of operation extending between a lower band edge and an upper band edge, and which includes:

(a) a length of transmission line means including at least two coupling points defining a transmission line mid-segment therebetween having a length of approximately one-quarter wavelength of a frequency within the operating frequency band;

(b) at least two absorptive loss means, each conductively coupled to its respective coupling point; and

(c) at least two resonant stub line means, each stub line means coupled to its associated absorptive loss means to provide effective coupling of said absorptive loss means to said transmission line means, said stub means having an effective electrical length to selectively disconnect and connect said absorptive loss means from and to said transmission line means at frequencies within said frequency band, a predetermined portion of said transmission line means being partially shunted by said absorptive loss means depending upon the ratio of the magnitudes of the transmission line means predetermined characteristic impedance to that of said absorptive loss means and upon the frequency of the incident microwave energy;



the improvement comprising:

(d) said transmission line means including coaxial transmission line means; and

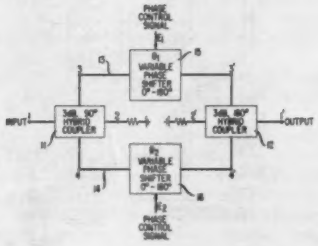
(e) each stub line means comprising flexible coaxial cable stub line means of relatively small diameter, bent so that the entire length thereof is disposed closely adjacent the outer surface of the outer conductor of said transmission line means for compactness and to form a generally cylindrical, capsule-like microwave equalizer.

4,153,886

NINETY DEGREE PHASE STEPPER

Hotze Miedema, Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 17, 1978, Ser. No. 878,528
Int. Cl.[2] H01P *1/18, 1/38;* **H03H** *7/30;* **H01P** *5/16*
U.S. Cl. 333—156 **5 Claims**



1. A 90 degree phase stepper comprising

a tandem array of a 90 degree hybrid coupler and a 180 degree hybrid coupler, each of which has two pairs of conjugate branches;

first and second variable phase shifters connecting one pair of conjugate branches of one of said couplers to one pair of conjugate branches of the other of said couplers;

CHARACTERIZED IN THAT

said phase shifters are capable of introducing differential phase shifts of only zero and 180 degree.

4,153,887
ELECTRICALLY TUNABLE BANDPASS FILTER

Rocco Poppa, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

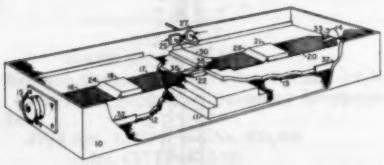
Filed Dec. 5, 1977, Ser. No. 857,852
Int. Cl.[2] H03H 7/10; H03J 3/26
U.S. Cl. 333—172 5 Claims

1. A radio frequency bandpass filter comprising:
an input terminal and ground terminal for receiving signal to be filtered;
an output terminal for delivering a filtered signal; first, second and third filter sections, each of said filter sections having a capacitor and inductor, each of said capacitors and inductors having a common connection forming a junction, said capacitors remaining ends being connected to said ground terminal; a first plurality of capacitors forming a series circuit with said junctions and said input and output terminals;
third, fourth and fifth inductors serially connecting each of the inductors in said filter sections with said ground terminal; and
a second plurality of capacitors for interconnecting the common ends of said inductors.

4,153,888
LOW LOSS MICROWAVE SWITCH

Maurice R. Cote, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 7, 1977, Ser. No. 840,197
Int. Cl.[2] H01P 1/15
U.S. Cl. 333—97 S 12 Claims

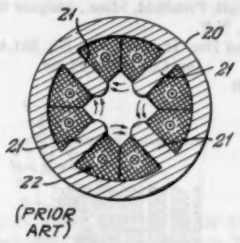


9. A switch having a housing and at least one input and at least one output therefrom comprising:
a pedestal having steps in the sides thereof,
a substrate supported on top of said pedestal in a spaced relationship to said housing,
a first conductor mounted on said substrate with one end thereof being located above said pedestal,
a second conductor mounted on said substrate in close proximity to said first conductor with one end thereof being located above said pedestal,
a semi-conductor mounted on said one end of said first conductor as to have a first terminal thereof electrically connected to said first conductor, said device being in close proximity to said second conductor,
means for connecting a second terminal of said device to said second conductor, and
means for alternately placing said device in a conducting state and a non-conducting state to selectively operate said switch.

4,153,889
METHOD AND DEVICE FOR GENERATING A MAGNETIC FIELD OF A POTENTIAL WITH ELECTRIC CURRENT COMPONENTS DISTRIBUTED ACCORDING TO A DERIVATIVE OF THE POTENTIAL

Hidetsugu Ikegami, 9-16, Tsurukawa 3-chome, Machida-shi, Tokyo, Japan

Filed Mar. 1, 1977, Ser. No. 773,312
Int. Cl.[2] H01F 5/00
U.S. Cl. 335—213 28 Claims

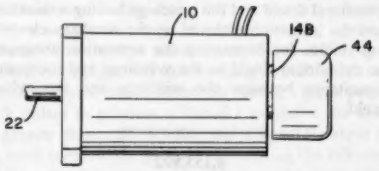


1. A method of generating a 2N-pole magnetic field in a hollow space, N being representative of an integer, said magnetic field being derived from a static magnetic potential ϕ defined in said space, said method comprising the steps of providing a yoke member having an inside surface which defines said space and provides a plane curve when cut by a plane, providing a coil member having current paths transversely along said yoke member's inside surface of said plane, and causing electric currents to flow through the respective current paths with a distribution of components perpendicular to said plane of said electric currents given by $-d\phi/ds$ where ds represents a differential line element tangential to said plane curve, said yoke member not having a parallel inside surface along which said current paths are arranged for generation of the magnetic field for $N=1$.

4,153,890
COIL COMPRESSED SOLENOIDS SUBASSEMBLY

George T. Coors, Tipp City, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 682,125, Apr. 30, 1976, Pat. No. 4,044,324. This application Aug. 18, 1977, Ser. No. 825,594
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.[2] H01F 7/08
U.S. Cl. 335—260 3 Claims



1. A dry solenoid comprising a non-ferrous tubular sleeve having an outer coil-receiving surface, a base formed of magnetic material telescopically received on an inside surface of said sleeve at one end thereof and having a radial shoulder extending outwardly of said sleeve forming one wall of a coil cavity, a pole of magnetic material telescopically received on inside surface of said sleeve in spaced relation to said base and having a radial shoulder extending outwardly of said sleeve forming a second wall of a coil cavity, said pole and base having inside diameters defining an axial cavity, an armature, end wall means on said solenoid supporting said armature for axial movement in said cavity, and an electrical coil having turns of wire wound in tension exclusively on said sleeve

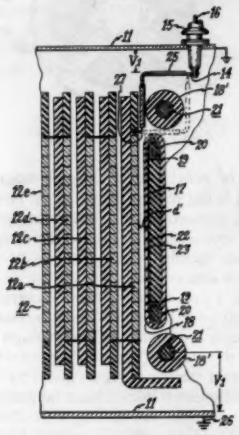
coil-receiving outer surface between said radial shoulders compressing said sleeve into firm mechanical and thermally conductive engagement with said base and said pole at the telescopic portions therebetween.

4,153,891

TRANSIENT VOLTAGE DISTRIBUTION IMPROVING LINE SHIELD FOR LAYER WOUND POWER TRANSFORMER

William J. McNutt, Pittsfield, Mass., assignor to General Electric Company, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,460
Int. Cl.[2] H01F *15/04*
U.S. Cl. 336—70 **6 Claims**



1. An improved electrostatic shield assembly and transformer windings arranged about an electromagnetic core and including a cylindrical electrostatic shield arranged around the windings having a separation distance from the windings for providing capacitive coupling within the windings, and a pair of electrostatic end shields adjacent both ends of the cylindrical shield, the improvement which comprises:

a pair of auxiliary ring shields adjacent said pair of end shields and having a layer of insulation for providing dielectric breakdown between the auxiliary shields and ground; and

a layer of insulation material on the cylindrical electrostatic shield for preventing dielectric breakdown between the cylindrical shield and the windings having a thickness less than the insulation material on the auxiliary electrostatic ring shields for decreasing the separation distance from the cylindrical shield to the windings and increasing the capacitance between the windings and the cylindrical shield.

4,153,892

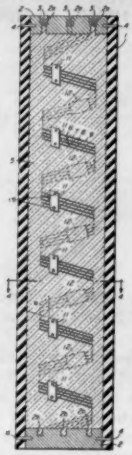
FUSIBLE ELEMENT AND PROCESS OF MANUFACTURING SAID ELEMENT

Frederick J. Kozacka, South Hampton, N.H., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Nov. 7, 1977, Ser. No. 849,171
Int. Cl.[2] H01H *85/04*
U.S. Cl. 337—159 **7 Claims**

1. A fuse for elevated circuit voltages including a tubular casing, a pair of terminal elements closing the ends of said casing, a plurality of spaced parallel fusible element wound in substantially helical turns and conductively in connecting said pair of terminal elements, and a pulverulent arc-quenching filler inside said casing surrounding said plurality of fusible elements wherein the novel features comprise

(a) a plurality of separate bridges of electric insulating material arranged substantially transversely to said plurality of fusible elements at spaced fixed points thereof tying together and thus integrating said plurality of fusible elements into a ribbon-like unitary structure, and maintaining



said plurality of fusible elements equidistantly spaced at said fixed points thereof; and

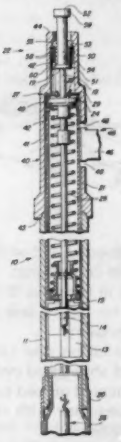
(b) said ribbonlike unitary structure being wound around a prismatic surface in such a way that said plurality of bridges are located between the edges of said surface.

4,153,893

END FITTING FOR HIGH-VOLTAGE FUSE

Roy T. Swanson, North Riverside, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Sep. 27, 1977, Ser. No. 837,245
Int. Cl.[2] H01H *85/02*
U.S. Cl. 337—201 **23 Claims**



1. An improved end fitting for use with a fuse of the type having a movable component in a first normal position or in a second position as a function of the intactness or lack thereof of a fusible element within the fuse; the component in the second position at least partially exiting beyond one end of the fuse; the end fitting being mountable to the one fuse end; wherein the improved end fitting comprises:

a body having a bore therethrough open at both ends, the first end of the body being mountable to the fuse to surround and enclose the one fuse end;

a member mounted for movement in the bore at the second body end between a first normal location, when the component is in the first normal position, and a second location when the component is in the second position;

resilient means for biasing the member to the first location; and

means for indicating when the member is in the second location.

4,153,894

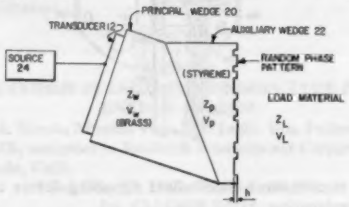
RANDOM PHASE DIFFUSER FOR REFLECTIVE IMAGING

Gerard A. Alphonse; David H. R. Vilkomerson, both of Princeton, and Bernard Hurley, Collingswood, all of N.J., assignors to United States of America as represented by the Secretary of the Department of Health, Education, and Welfare, Washington, D.C.

Filed Aug. 9, 1977, Ser. No. 823,186

Int. Cl.[2] G01S *9/66*

U.S. Cl. 340—1 R **6 Claims**



1. In an ultrasonic imaging system including a transducer means for generating accoustic waves and a medium through which said accoustic waves travel, said improvement comprising random means, inserted accoustically between said transducer means and said medium and fixably mounted to said transducer means, for phase-wise diffusing said accoustic waves generated by said transducer means, wherein said random means comprises a plate made up of relatively lossless elements for emitting accoustic energy at varying phase-wise relationships, said phase relationship depending upon the element in the plate, said elements being randomly oriented on said plate.

4,153,895

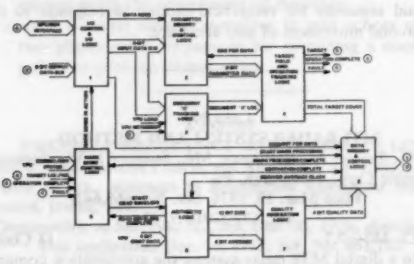
MARK SENSE READER

James G. Weisbrod, Dallas, and John C. Eby, Jr., Bedford, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Aug. 1, 1978, Ser. No. 930,106

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 AG **2 Claims**



1. An apparatus for reading and analyzing the quality of marks on a document to distinguish between intended marks and other marks comprising means for locating and tracking marks on the document, means for comparing the mark locations and number of marks with known parameter data, means for analyzing the quality of any mark at a known mark location, and assigning a quality factor to the mark, means for storing the quality factor assigned to each mark, and means for analyzing the quality factor for all the marks on a given document to determine which marks found are intended marks.

4,153,896

COMPRESSION AND EXPANSION OF SYMBOLS

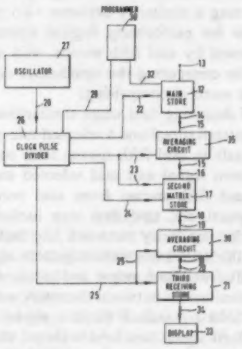
Roy L. White, Melbourn, England, assignor to Xenotron Limited, London, England

Filed Jul. 1, 1977, Ser. No. 812,343

Claims priority, application United Kingdom, Jul. 8, 1976, 28522/76

Int. Cl.[2] G06K *9/00*; G06F *3/14*

U.S. Cl. 340—731 **3 Claims**



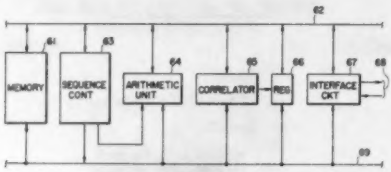
1. A method of providing a representation of an image, whose dimensions are different from those of the image, which includes the steps of feeding into a first store coded information derived by scanning the image in a first direction, reading out the information in the first store in serial form under the control of a first clock signal via an averaging circuit which counts the number of digital pulses occurring during a given period of the clock pulses to produce a signal 1 output if the average level is greater than a given value and a signal 0 output if the average level is below the given level, reading the information readout from the first store in serial form under the control of a second clock signal into a second matrix store to provide a record of information corresponding to the image scanned, scanning the information in the second store in a second direction to provide a serial readout of the information in the second store under the control of a third clock signal via an averaging circuit which counts the number of digital pulses occurring during a given period of the third clock pulses to produce a signal 1 output if the average level is greater than a given value and a signal 0 output if the average level is below the given level, reading the information readout from the second store into a third store under the control of a fourth clock signal, reading out information in the third store and displaying the information readout from the third store in a display device.

4,153,897

METHOD AND DEVICE FOR DETECTING THE SIMILARITY BETWEEN STANDARD AND UNKNOWN PATTERNS

Michio Yasuda, Koganei; Yasuaki Nakano, Hino; Hiromichi Fujisawa, Urawa, and Toshihiro Hananoi, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 14, 1977, Ser. No. 815,825
Claims priority, application Japan, Jul. 23, 1976, 51-87280
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 Q **11 Claims**



1. A method for detecting the similarities between an unknown pattern signal and a plurality of standard pattern signals in a pattern recognition system having first means for converting an unknown pattern into a corresponding electrical unknown pattern signal, second means for storing said unknown pattern signal, third means for storing a plurality of standard pattern signals, fourth means for shifting a pattern signal, fifth means for detecting a similarity between two pattern signals, and sixth means for performing logical operations on said similarities detected by said fifth means, said sixth means including means for comparing the similarities detected by said fifth means, said method comprising:

a first step of detecting first stage similarities between said unknown pattern signal and a selected one of said standard pattern signals in said fifth means after sending said unknown pattern signal and said selected standard pattern signal to said fifth means from said second and third means, respectively, said first step including a step of detecting the similarity between the unknown pattern signal and the selected standard pattern signal without a relative shift from each other and steps of detecting the respective similarities between the unknown pattern signal and the selected standard pattern signal after said unknown pattern signal and said selected standard pattern signal are relatively shifted from each other with respective first shifting values within a first extent in said fourth means;

a second step of detecting the maximum value of said first stage similarities between the unknown pattern signal and the selected standard pattern signal;

a third step of detecting second stage similarities between said unknown pattern signal and said selected standard pattern signal after said unknown pattern signal and said selected standard pattern are relatively shifted from each other in said fourth means with respective second shifting values within a second extent which is larger than said first extent, only when said maximum value of the first stage similarities does not correspond to said similarity between the unknown pattern signal and the selected standard pattern signal without said relative shift;

a fourth step of detecting the maximum value of said second stage similarities in said sixth means; and

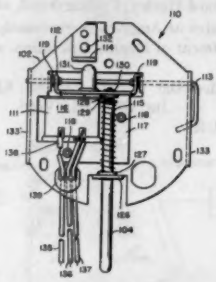
a fifth step of supplying the maximum value of the first stage similarities as the similarity between the unknown pattern signal and the selected standard pattern signal when the maximum value of the first stage similarities corresponds to the similarity therebetween without said relative shift and supplying the maximum value of the second stage similarities as the similarity between the unknown pattern signal and the selected standard pattern signal when the maximum value of the first stage similarities does not correspond to the similarity therebetween without said relative shift.

4,153,898

AUDIBLE ALARM WITH LAMINATED MAGNETIC CORE

Carl M. Larime, Fairfield, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 720,879, Sep. 7, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 868,155
Int. Cl.[2] G08B *3/00*
U.S. Cl. 340—396 **7 Claims**



1. An electro-mechanical sound signalling device comprising in combination:

(a) a generally planar bracket assembly for supporting the components of said signalling device;

(b) a U-shaped ferromagnetic structure having first and second legs supported on said planar bracket so that said first and secnd legs lie in planes parallel to that of said planar bracket;

(c) a coil wound on said first leg for generating magnetic flux in said magnetic structure in response to a flow of current in said coil;

(d) an armature pivotally supported on a hinge pin, which, in turn, is supported on said bracket assembly in a plane parallel to said recited planes;

(e) each of said first and second legs terminating in an individual pole face;

(f) said armature including a portion normally separated from said pole faces a controlled distance for pivotal attraction of said portion of said armature to said pole faces in response to generation of a magnetic flux in said magnetic structure; and

(g) a longitudinal and reciprocally movable striker situated proximate and parallel to said second leg and coupled to said armature for reciprocal motion in response to the pivotal movement of said armature.

4,153,899

MTI RADAR SYSTEM AND METHOD

John W. Taylor, Jr., Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

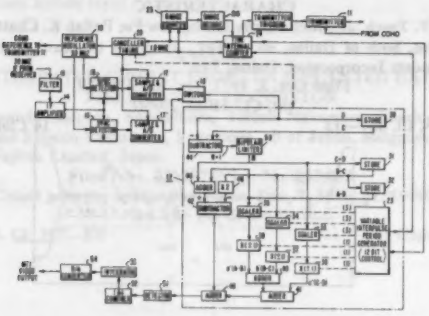
Filed Mar. 10, 1976, Ser. No. 665,643
Int. Cl.[2] G01S *9/42*
U.S. Cl. 343—7.7 **11 Claims**

1. In a digital MTI radar system, the combination comprising:

means for generating radar transmission pulses with a variable interpulse period following either an increasing or decreasing exponential multiple sawtooth pattern;

means for receiving pulse echoes;

means for comparing a sequence of at least four of said pulse echoes; and



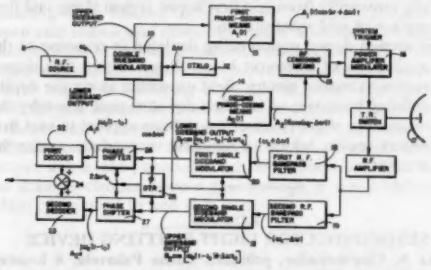
means for variably weighting individual echoes when comparing said sequence to improve the velocity response of the system.

4,153,900

PHASE-CODED PULSE COMPRESSION TYPE PULSED ENERGY SYSTEM

Leslie M. Novak, Mission Viejo, and Leslie Yen, Fullerton, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 20, 1967, Ser. No. 692,054
Int. Cl.[2] G01S *9/233*
U.S. Cl. 343—17.2 PC **5 Claims**



1. In a phase-coded pulse-compression type pulsed energy system, dual code means for reducing the sidelobes of the autocorrelation function and comprising

means for synchronously transmitting two phase-coded, pulsed carrier frequencies, the phase code of each frequency being the compliment of the other;

receiver-decoder means responsive to said echoes of said two phase-coded frequencies for providing a combined pulse compression output signal.

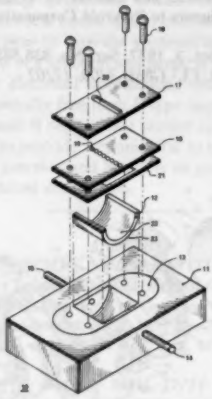
4,153,901

VARIABLE FREQUENCY MULTI-ORIFICE IJP

John T. White, Grand Prairie, and Kenneth T. Lovelady, Irving, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Continuation of Ser. No. 752,769, Dec. 20, 1976, abandoned.
This application Dec. 16, 1977, Ser. No. 861,155
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **2 Claims**

1. A wide band multi-orifice variable frequency modulator for an ink jet printer comprising a hemicylindrical transducer, a solid wave damping material backing said transducer to attenuate unwanted resonance peaks over the frequency range of operation, a base member having a recess in which the wave damping material and transducer resides, and a nozzle plate



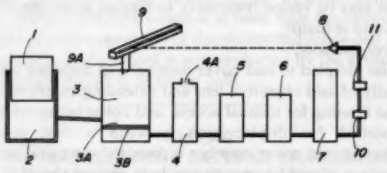
closing the transducer such that each of the orifices is equidistant from the hemicylindrical transducer.

4,153,902

BUBBLE REMOVAL IN AN INK LIQUID SUPPLY FOR AN INK JET SYSTEM PRINTER

Yoshio Kanayama, Nabari, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1977, Ser. No. 851,951
Claims priority, application Japan, Nov. 19, 1976, 51-156105; Mar. 26, 1977, 52-33505
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—140 R **11 Claims**



1. In an ink liquid supply system for an ink jet system printer which emits ink droplets from a nozzle for performing a writing operation, said ink liquid supply system being provided with an ink liquid reservoir for containing ink liquid therein, conduit means for connecting said ink liquid reservoir with said nozzle and supply means for supplying the ink liquid through said conduit means to said nozzle, the improvement comprising:

a subtank disposed between said ink liquid reservoir and said supply means;

a first coarse filter disposed in said subtank; and

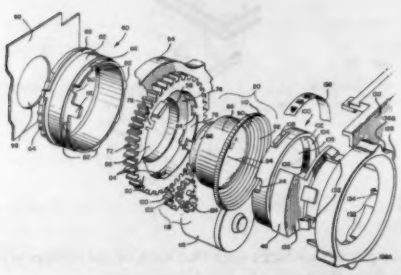
a second fine filter disposed in said subtank.

4,153,903

LENS SHIELD ACTUATED AUTO/MANUAL FOCUS CONTROL INHIBIT/OVERRIDE

Donato F. Pizzuti, Saugus, and Charles W. Triggs, Marshfield, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1977, Ser. No. 838,585
Int. Cl.[2] G03B *3/00, 17/02*
U.S. Cl. 354—195 11 Claims



1. A camera comprising:

a first actuator for selectively coupling said camera to a source of energy;

a housing member having a first opening and a second opening;

a shutter mechanism mounted in said housing;

a variable focus objective lens mounted on said housing with its optical axis aligned with said first opening of said housing;

energizable first means for deriving a signal representative of the actual distance between said apparatus and an object remote therefrom;

second means normally responsive to the operation of said first actuator for rendering said first means operative and then focusing said objective lens dependent upon the signal derived by said first means and then actuating said shutter mechanism, said second means including a second actuator displaceably mounted so as to be manually accessible through said second opening of said housing member, and third means for coupling said second actuator to said objective lens so that the focusing of said objective lens may be varied responsive to manual actuation of said second actuator;

a cover member;

a collar coupled to said cover member and disposed peripherally of said objective lens and extending exteriorally of said housing for manual access, said collar being rotatably mounted for displacement between a first position wherein said cover member is disposed over said second opening of said housing to preclude manual access to said second actuator and a second position wherein said cover member is positioned out of alignment with said second opening of said housing to provide manual access through said second opening of said housing to said second actuator; and

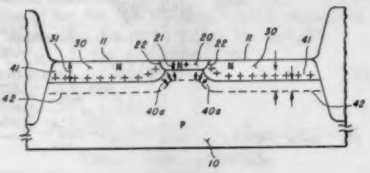
means responsive to the displacement of said cover member from its said first position into its said second position for disabling said first means so that said second means is responsive to the operation of said first actuator for purposes of actuating said shutter mechanism but not responsive to the operation of said first actuator for purposes of focusing said objective lens dependent upon a signal derived by said first means.

4,153,904

SEMICONDUCTOR DEVICE HAVING A HIGH BREAKDOWN VOLTAGE JUNCTION CHARACTERISTIC

Al F. Tasch, Jr., Richardson; Horng-Sen Fu; Pallab K. Chatterjee, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 3, 1977, Ser. No. 838,779
Int. Cl.[2] H01L *29/90*
U.S. Cl. 357—13 14 Claims



1. A semiconductor device having a p-n junction characterized by low electric field crowding and a resulting high avalanche breakdown voltage requirement comprising:

a semiconductor substrate having dopant impurity atoms of one type conductivity and a first surface;

a first doped region in said substrate at said first surface and having dopant impurity atoms of a second type conductivity opposite to said one type conductivity of said substrate;

a second doped region in said substrate at said first surface and having dopant impurity atoms of said second type conductivity but of less density than the dopant impurity atoms of said first doped region, said second doped region bounding the entire lateral perimeter of said first doped region in contiguous relation thereto and extending laterally outwardly from said first doped region along said first surface of said substrate; and

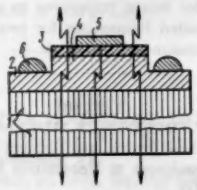
said second doped region being depleted in response to the application of a reverse bias voltage to said first doped region to reduce electric field crowding along the depth-defining boundary of said first doped region, whereby the magnitude of the reverse bias voltage applied to said first doped region which is required to produce avalanche breakdown is increased.

4,153,905

SEMICONDUCTOR LIGHT-EMITTING DEVICE

Revaz A. Charmakadze, prospekt Vazha Pshavela, 6 kvartal, korpus 24, kv. 23, and Rafael I. Chikovani, prospekt Vazha Pshavela, 51, korpus 8, kv. 1, both of Tbilisi, U.S.S.R.

Filed Mar. 28, 1978, Ser. No. 891,166
Claims priority, application U.S.S.R., Apr. 4, 1977, 2468614
Int. Cl.[2] H01L *29/16*
U.S. Cl. 357—16 4 Claims



1. A semiconductor light-emitting device comprising: a sapphire substrate; an epitaxial layer of monocrystalline semiconductor p-type gallium nitride deposited on said substrate; a layer of semiconductor n-type aluminum nitride deposited on said semiconductor gallium nitride layer and forming therewith an injecting heterojunction ensuring emission toward said

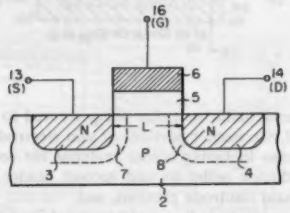
substrate; two electrodes whereto a bias voltage is applied; first said electrode being on said semiconductor gallium nitride layer; second said electrode being on said semiconductor aluminum nitride layer.

4,153,906

INTEGRATED CIRCUIT USING AN INSULATED GATE FIELD EFFECT TRANSISTOR

Masaichi Shinoda, Sagamihara; Tetsuo Nakamura, Machida, and Minoru Yamamoto, Yokohama, all of Japan, assignors to Fujitsu Limited, Japan

Filed Nov. 22, 1977, Ser. No. 853,852
Claims priority, application Japan, Dec. 7, 1976, 51/146860
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **11 Claims**



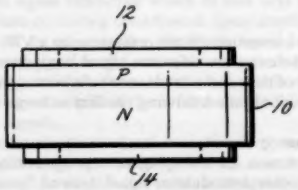
1. An integrated circuit using an insulated gate field effect transistor of the punch-through type, in which said insulated gate field effect transistor is formed in a semiconductor substrate of a predetermined conductivity type and has a source electrode, gate electrode, and a drain electrode, said source and drain electrodes located in different regions of the surface of said substrate, and said gate electrode located on a gate insulating layer formed on said semiconductor substrate between said source and drain electrodes, wherein the impurity concentration in said semiconductor substrate, and the channel length between said source and drain electrodes, and the thickness of said gate insulating layer are selected such that said insulated gate field effect transistor is rendered non-conductive in the absence of a gate voltage applied to said gate electrode, and said insulated gate field effect transistor is rendered conductive due to the punch-through effect between said source and drain electrodes when a gate voltage of a predetermined polarity is applied to said gate electrode.

4,153,907

PHOTOVOLTAIC CELL WITH JUNCTION-FREE ESSENTIALLY-LINEAR CONNECTIONS TO ITS CONTACTS

Vernon K. Kofron, Webster Groves, Mo., assignor to Vactec, Incorporated, Maryland Heights, Mo.

Continuation-in-part of Ser. No. 797,631, May 17, 1977. This application Dec. 5, 1977, Ser. No. 857,659
Int. Cl.[2] H01L *27/14, 31/00, 31/14*
U.S. Cl. 357—30 **8 Claims**



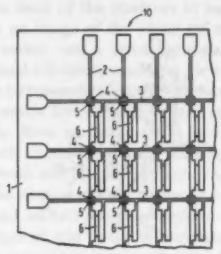
1. A photovoltaic cell that has a first region with a P dopant which makes said first region a P region, a second region with an N dopant which makes said second region an N region, an electrical contact which is connected to said P region and which includes an admixture of a fused glass component and of a conductor-forming component, one of said components having P-forming properties which make said electrical contact a P electrical contact, said electrical contact coacting with said P region to provide a connection to said P region which is devoid of a junction and hence is an essentially-linear, low-resistance electrical connection, and a second contact which is substantially free from P-type impurities and which is connected to said N region, said second contact coacting with said N region to provide a connection to said N region which is devoid of a junction and hence is an essentially-linear low-resistance electrical connection.

4,153,908

PHOTOSENSITIVE MATRIX WITH SUBSTRATE

Juergen Meyer, Taunusstein, Fed. Rep. of Germany, assignor to Heimann GmbH, Fed. Rep. of Germany

Filed Nov. 4, 1976, Ser. No. 738,898
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1975, 2551956
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—32 **3 Claims**



1. In a photosensitive matrix for a punch card reader device, said matrix having a substrate provided with a first group of strip-shaped conductors and a second group of strip-shaped conductors with the first group being column conductors and the second group being row conductors extending across the column conductors to form a plurality of spaced points of intersection, said matrix having a photoconductive cell in series with a rectifier adjacent each point of intersection to interconnect the row conductor to the column conductor, the improvement comprising the substrate consisting of means for preventing optical cross talk between adjacent cells, said means being a material which is at least light impermeable in the light-sensitive spectrum of the photoconductive cell so that light projected on one cell is not conducted by the substrate to create a false signal in adjacent cells.

4,153,909

GATED COLLECTOR LATERAL TRANSISTOR STRUCTURE AND CIRCUITS USING SAME

Robert C. Dobkin, Menlo Park, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 10, 1973, Ser. No. 423,430
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—44 **4 Claims**

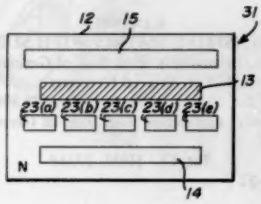
1. In a lateral transistor structure:

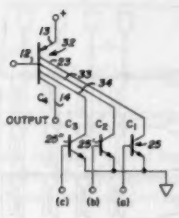
a semiconductive body having emitter means, base means and collector means, said emitter means being disposed for injecting electrical current carriers into said semiconductive body, said collector means being laterally disposed of said emitter means for collecting said injected carriers, said base means being laterally interposed between said emitter and collector means for controlling the flow of

injected carriers between said emitter and collector means;

said collector means including, first and second collector portions laterally spaced apart across an intervening portion of said base means, said first collector portion being interposed between said emitter means and said second collector portion for controlling the flow of interjected carriers from said emitter means to said second collector portion;

means for electrically insulating said first collector portion from said second collector portion for DC potential to permit independent DC operating potentials to be established thereon; and





wherein said collector means includes at least a third collector portion interposed between said first collector portion and said second collector portion for controlling the flow of injected carriers between said first collector portion and said second collector portion, and means for electrically insulating said third collector portion from said first and second collector portions to permit an independent operating DC electrical potential to be applied to said third collector portion relative to the operating potentials applied to said first and second collector portions; and

wherein at least one of said collector portion is segmented into a plurality of independently operable electrode portions.

4,153,910

MOLDED SEMICONDUCTOR DEVICE WITH HEADER LEADS

Seiichi Itoh, and Kensuke Suzuki, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 27, 1977, Ser. No. 810,164

Claims priority, application Japan, Jun. 26, 1976, 51-75872

Int. Cl.[2] H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—68 **24 Claims**

1. A molded semiconductor device with header leads, comprising:

a. at least one semiconductor pellet having at least one p-n junction,

b. a pair of electrode leads holding said semiconductor pellet therebetween, each of said electrode leads comprising;

1. an electrode portion, and

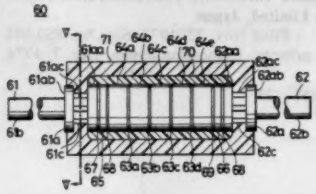
2. a connecting lead portion which is formed of the same metal as that of said electrode portion,

3. said electrode portion including two tabular header portions separated from each other, and a columnar neck portion coupling both of said header portions between opposing surfaces thereof,

4. said lead portion and said neck portion extending coaxially,

5. said lead portion being joined to a first of said two header portions of said electrode portion,

6. said neck portion having a cross-sectional area in a direction orthogonal to the axial direction which is larger than that of said lead portion,



7. said semiconductor pellet being secured to the second of said two header portions of said electrode portion,

c. first means including solder material for securing said semiconductor pellet to said second header portion of each of said electrode portions, and

d. second means including mold material for encapsulating said semiconductor device from said first header portion of one of said electrode portions to said first header portion of the other electrode portion, so as to cover the entire periphery of said semiconductor pellet.

4,153,911

COLOR CORRECTION CIRCUIT FOR A COLOR TELEVISION RECEIVER

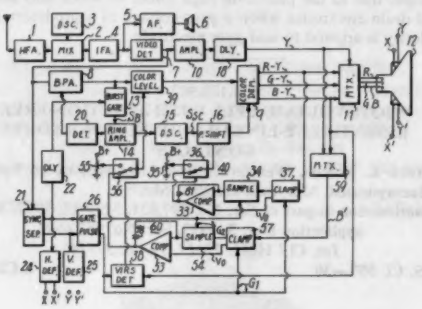
Katsuo Isono, Kawagoe, and Seiji Sanada, Yokosuka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 6, 1977, Ser. No. 839,847

Claims priority, application Japan, Oct. 6, 1976, 51-120102

Int. Cl.[2] H04N *9/62, 9/535*

U.S. Cl. 358—10 **9 Claims**



1. A color correction circuit responsive to a VIR signal that includes a chrominance reference signal component during a first interval of time and a luminance reference signal during a second interval of time following the first interval, said circuit comprising:

a chrominance circuit;

clamping means for clamping to a predetermined voltage level a color demodulator signal derived from said chrominance reference signal component during said first interval;

comparator means connected to said clamping means to receive the clamped output signal of said clamping means and to compare said clamped output signal during said

second interval with said predetermined voltage level for producing a compared signal output; and

means connected to said comparator means to be controlled by said compared signal output and connected to said chrominance circuit to correct the response thereof to chrominance signals.

4,153,912

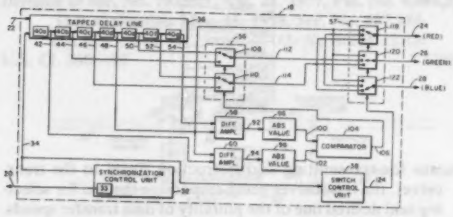
APPARATUS AND METHOD FOR ELECTRONICALLY IMPROVING THE APPARENT RESOLUTION OF A COLOR IMAGING CCD

Nathan Gold, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 27, 1978, Ser. No. 890,122

Int. Cl.[2] H04N 9/07

U.S. Cl. 358—44 **9 Claims**



1. A color electronic camera comprising

an image receiving device composed of a plurality of photosensitive elements for generating and storing electrical image signals representative of the image energy incident on the elements, said elements being arranged to form a plurality of image receiving scan lines,

an optical bandpass filter having a plurality of filtering segments in a repeating pattern, said filter having a selected optically aligned spatial relationship with said image receiving device so that each of said photosensitive elements is associated with one filtering segment for receiving energy in one of a plurality of selected wavelength ranges,

means for retrieving said stored electrical image signals on a scan line-by-scan line basis and for providing the retrieved electrical signals, corresponding to said photosensitive elements of a scan line, in sequentially occurring time intervals, each of said time intervals thereby being identified and associated with a signal amplitude level corresponding to one of said selected wavelength ranges, and

means for deriving from said retrieved electrical signals a plurality of color electrical signals, the number of color signals being equal to the number of said selected wavelength ranges, said deriving means comprising

means for comparing, for each successive active time interval, the signal amplitude level of the retrieved electrical signal with corresponding next earlier and next later occurring coordinated signal amplitude levels of the retrieved signal, and for generating a comparison output signal indicating which of said next earlier and next later occurring coordinated signal amplitude levels is closer in value to the amplitude signal level of the retrieved signal in the active time interval, and

means for providing, for each successive active time interval, a signal amplitude level for each of said color electrical signals,

the color electrical signal corresponding to the wavelength range associated with the active time interval having an amplitude value corresponding to said retrieved electrical signal amplitude level, and

each other color electrical signal having an amplitude value corresponding to an associated coordinated time interval signal amplitude level determined in response to the comparison output signal.

4,153,913

HEAD-UP DISPLAYS

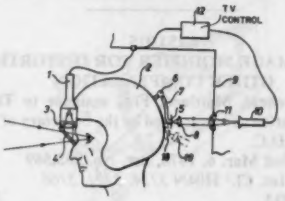
David W. Swift, Clwyd, Wales, assignor to Pilkington P.E. Limited, Lancashire, England

Filed Jun. 13, 1977, Ser. No. 805,703

Claims priority, application United Kingdom, Jun. 18, 1976, 25325/76

Int. Cl.[2] H04N 7/18

U.S. Cl. 358—93 **19 Claims**



1. Head-up display apparatus comprising display means having a display surface at which said display means presents an image to display visual information, means for mounting the display means on the head of an observer, combiner means for mounting on the head of the observer to superimpose on the observer's view an image of the visual information displayed by the display means, and a visual information relay system comprising a visual information source, viewing means having a viewing surface arranged effectively to view the visual information source, means for focusing light from the visual information source to form an image on to said viewing surface, means operatively connecting said viewing surface of said viewing means with said display surface of said display means to display on said display surface an image of the visual information as focused on said viewing surface, said relay system having at least one of said visual information source and said viewing means arranged to be mounted at a fixed position and the other arranged to be mounted on the head of the observer such that change of angular position of the observer's head produces change of position of the visual information relative to the viewing means and corresponding change of position of the display of the information on said display surface, thereby to maintain a substantially constant apparent angular spatial position of the image of the visual information on said display surface as viewed by the observer.

4,153,914

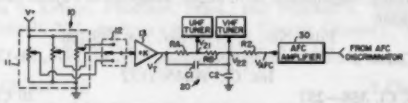
NETWORK FOR APPLYING A PLURALITY OF CONTROL VOLTAGES TO A COMMON CONTROL TERMINAL

Rangaswamy Arumugham, Batavia, and George H. Kam, Tonawanda, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 31, 1978, Ser. No. 892,118

Int. Cl.[2] H04N 5/50; H04B 1/16; H03K 5/00

U.S. Cl. 358—195 **5 Claims**



2. In a television receiver having a voltage-controlled tuner, a source of selectable tuning voltage and a source of AFC voltage, a compensated network for combining the tuning voltage and the AFC voltage comprising:

first resistive means for coupling the tuning voltage to the tuner's tuning control terminal;

second resistive means for coupling the AFC voltage to the tuner's tuning control terminal;

first capacitive means coupled between the source of tuning voltage and the tuning control terminal; and

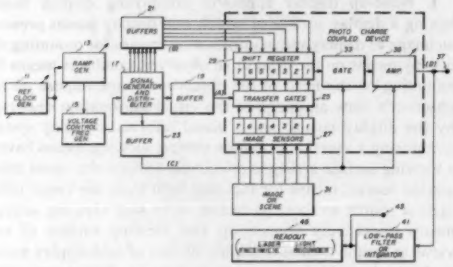
second capacitive means coupled between the tuning control terminal and circuit ground for establishing, in conjunction with the first capacitive means, the AFC time-constant, said resistive and capacitive means so arranged that the voltage at the tuning control terminal responds substantially instantaneously to changes in the tuning voltage.

4,153,915

OPTICAL IMAGE MODIFIER FOR DISTORTION OR OTHER COMPENSATION

John C. McKechnie, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1978, Ser. No. 883,569
Int. Cl.[2] H04N *3/14, 5/21, 5/66*
U.S. Cl. 358—213 **31 Claims**



1. A parameter modifier, comprising in combination:

means for sensing the aforesaid parameter to be modified and for producing a first signal proportional thereto;

means for timely storing and reading out said first signal in effective response to second and third signals, respectively;

means connected between the output of said parameter sensing means and the input of the aforesaid first signal storing and reading out means for transferring said first signal from said parameter sensing means to said storing and reading out means for the timely storage thereof therein in response to said second signal;

means effectively connected to the inputs of said first signal transferring means and said storage and readout means for generating said second and third signals and distributing them thereto, respectively, with said second signal being supplied to said first signal transferring means a predetermined time prior to the time said third signal is supplied to said storing and readout means.

4,153,916

FACSIMILE COMMUNICATION SYSTEM AND METHOD

Hirohide Miwa; Kiyoshi Oikawa, both of Kawasaki, and Yoshio Iizuka, Sagamihara, all of Japan, assignors to Fujitsu Limited, Japan

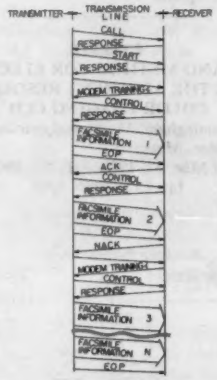
Filed Nov. 8, 1977, Ser. No. 849,708
Claims priority, application Japan, Nov. 12, 1976, 51-136008
Int. Cl.[2] H04N *1/32*
U.S. Cl. 358—257 **20 Claims**

15. A facsimile remote receiver for processing facsimile information transmitted thereto by a transceiver at a desired one of a plurality of data transfer speeds based on the error rate of said facsimile information transmission, said receiver comprising:

means for receiving the transmitted facsimile information from said transceiver;

printing unit means for reproducing the documents according to the facsimile information;

error rate detector means for detecting the error rate of the facsimile information and for producing an instruction signal; and



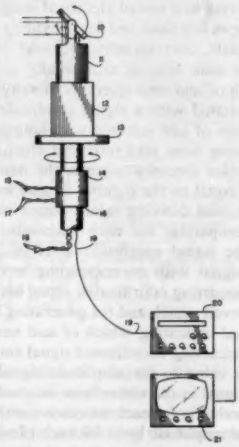
means for transmitting said instruction signal to the transceiver, the transceiver being responsive thereto for selecting said desired one of the plurality of data transfer speeds.

4,153,917

IMAGE STABILIZER SYSTEM FOR STOP-ACTION PLAYBACK

Paul S. Catano, San Diego; Michael A. Monahan, Poway, and Keith Bromley, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1978, Ser. No. 871,313
Int. Cl.[2] H04N *3/08, 5/78*
U.S. Cl. 360—10 **8 Claims**



1. A "stop-action" playback system for displaying a selected image from light energy data representative of a panoramic scene generated in sequential interlaced field raster format by a sensor being driven in azimuth comprising:

means for developing an azimuth rate signal as a function of the rate said sensor is driven in azimuth;

recording means for receiving and sequentially storing said light energy data and said azimuth rate signal in synchronism with said light energy data;

means receiving said azimuth rate signal for developing a time signal as a function of the rate said sensor is driven in azimuth;

means impressing said time signal as a delay between said sequential first and second interlaced fields of light energy data for correcting the delay between the sensing of said first and second interlaced fields due to the sequential field rate of said raster formate relative to the azimuthal rate at which said sensor is driven; and

means for visually displaying "stop-action" playback of said selected frame comprised of said first and second fields interlaced in time delay corrected form.

4,153,918

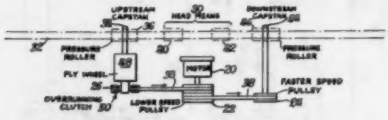
DUAL CAPSTAN TAPE TRANSPORT MECHANISM

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Division of Ser. No. 791,707, Apr. 28, 1977, Pat. No. 4,096,533. This application Mar. 16, 1978, Ser. No. 887,184

Int. Cl.[2] G11B *15/29, 15/43, 15/60;* **B65H** *23/08*

U.S. Cl. 360—93 **7 Claims**



1. In a dual capstan tape transport mechanism having a frame; means for training a magnetic tape along a path for movement successively between an upstream capstan and an upstream pressure roller, past head means, and between a downstream capstan and a downstream pressure roller; motor means; drive transmission means between the motor means and both of the capstans for simultaneously driving said capstans; and control means actuatable to move both of the pressure rollers from off positions away from the tape to play positions pressing the tape against the respective capstans; the improvement comprising:

said drive transmission means being effective, when the pressure rollers are in off positions, to simultaneously rotate said downstream capstan at a tape-playing speed and said upstream capstan at a slightly lower speed;

said drive transmission means including overrunning clutch means between said motor means and said upstream capstan, said overrunning clutch means enabling said motor means to drive said upstream capstan when said pressure rollers are in off position, and said overrunning clutch means being effective to free-wheel and enable said tape to drive said capstan at said tape-playing speed when said pressure rollers are in said play positions.

4,153,919

PROTECTIVE HOOD FOR CASSETTE TAPE RECORDERS

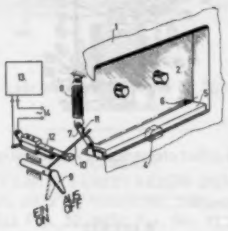
Jurgen Kramer, St. Georgen, Fed. Rep. of Germany, assignor to Dual Gebruder Steidinger, St. Georgen, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,469

Int. Cl.[2] G11B *5/00*

U.S. Cl. 360—129 **1 Claim**

1. A protective device for a cassette tape recorder, comprising: means for receiving a tape cassette in said cassette tape recorder and holding said cassette in an operating position in said recorder; a magnetic head having a face side directed upwards and located underneath said means for receiving a cassette in said tape recorder and proximate the tape portion of said cassette when in the operating position; a protective hood for covering said face side of said magnetic head and rotatably located about a horizontal axis perpendicular to a gap plane of said magnetic head; a spring having means for engaging said protective hood to urge the hood pivotally into a closed position for covering said face side of said magnetic head when there is no tape cassette in said receiving means; switch means for connecting the recorder to a power supply line; connecting means between said switch means and said protective hood and located so that upon actuating said switch means to an ON position said protective hood is rotated so as to cooperate with the operating position of said tape recorder and against said spring means engaging said hood; said switch means being actuable to an OFF position for releasing movement of said



hood to said closed position; stop means located along the free edge of said protective hood and positioned at a distance from said axis about which said protective hood is pivotable; said hood having an open position in which said stop means abutts the major remote cassette side when said cassette is in the operating position; said stop means being in contact with said cassette when in operating position and upon removal of said cassette the spring means returns said hood to its closed position.

4,153,920

RECORDING METHOD EMPLOYING A MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Tatsuji Kitamoto; Masaaki Suzuki, and Shinichiro Dezawa, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 717,323, Aug. 24, 1976, Pat. No. 4,097,650. This application Nov. 21, 1977, Ser. No. 853,569

Claims priority, application Japan, Aug. 23, 1975, 50/103481

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.[2] G11B *5/008*

U.S. Cl. 360—55 **11 Claims**

1. In a method of recording or reproducing employing a magnetic recording medium wherein the relative speed between the magnetic recording head and the magnetic recording medium is v μm/sec, the improvement comprising employing as the magnetic recording medium, a non-binder type magnetic recording medium comprising a ferromagnetic metal thin film as a magnetic recording layer on a non-magnetic flexible support, the support having a surface roughness of 0.04 to 0.08 μm and a period of surface roughness of at most $v/10^6$ μm.

4,153,921

THERMALLY STABILIZED METAL OXIDE VARISTORS

James S. Kresge, Pittsfield, Mass., and Richard A. Menelly, Caldwell, N.J., assignors to General Electric Company, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,214

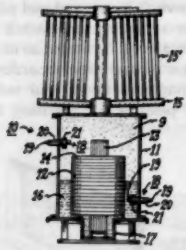
Int. Cl.[2] H02H *7/04*

U.S. Cl. 361—40 **5 Claims**

1. A method for thermally stabilizing metal oxide varistors of the type used as voltage surge protectors in lightning arresters for vaporizable fluid-cooled electrical apparatus having a heat exchanger comprising the steps of:

mounting the metal oxide varistors above the vaporizable coolant for contact with condensed fluid returning from the heat exchanger;

connecting one electrode of the metal oxide varistors with an input lead to the electrical apparatus; and



connecting the other electrode of the metal oxide varistor to ground.

4,153,922

RELAY CONTROL CIRCUIT

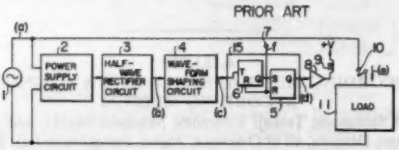
Nobuo Azuma, Yokohama; Yuuhei Abe, Fujisawa; Katsuo Mohri, Yokosuka, and Yuhiko Yabe, Tochigi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 2, 1977, Ser. No. 856,978

Claims priority, application Japan, Dec. 3, 1976, 51-144805; Dec. 3, 1976, 51-144806

Int. Cl.[2] H02H *7/22*

U.S. Cl. 361—3 **5 Claims**



1. A relay control circuit comprising a commercial power supply, a waveform-shaping circuit for shaping the waveform of the voltage applied from said commercial power supply thereby to produce a reference clock pulse signal, a timer circuit, a relay turned on and off in response to an output signal of said timer circuit, a polarity-reversing circuit the output of which is reversed in response to the output signal of said timer circuit, and means for applying to said timer circuit through said polarity-reversing circuit said reference clock signal produced from said waveform shaping circuit.

4,153,923

GROUND MONITORING SYSTEM AND METHOD

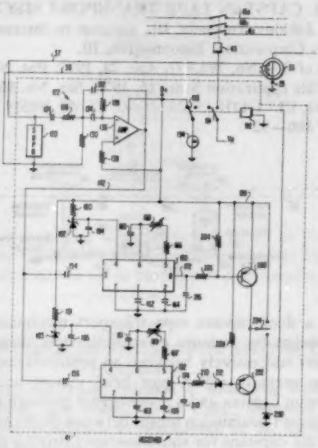
Robert G. Graf, P.O. Box 1628, Bluefield, W. Va. 24701

Filed Feb. 15, 1977, Ser. No. 768,743

Int. Cl.[2] H02H *5/10*

U.S. Cl. 361—48 **2 Claims**

1. A continuity monitoring system for a machine having a power cable for supplying electrical voltage and current to the machine from a power supply, the cable having power conductors and a ground conductor which is grounded to the machine, said system comprising; transmitter means for generating a monitor signal having a predetermined amplitude and a predetermined frequency different from the frequency of said current supplied by said power supply, first coupling means located between the power supply and the machine for coupling the monitor signal to a conductor of the cable, second coupling means at the machine for receiving the monitor signal from the conductor and for coupling the signal to a ground on the machine so that the signal is conducted to and transmitted along the ground conductor, receiver means, third coupling means remote from the machine for coupling the monitor signal from the ground conductor to said receiver means, said receiver means comprising a discriminator means comprised of a pair of phase locked loop means connected in parallel, each of said phase locked loop means having the same amplitude and frequency characteristic and each being responsive to said received monitor signal for producing a predetermined output only when said received monitor signal is above a predetermined level and within a predetermined frequency range, power switch means having two states and being connected between said power supply and said cable for supplying power from said supply to said cable when in a first state and for interrupting said power when in a second state, and circuit means connected between said phase locked loop means and said power switch means for causing said power switch means to switch to said second state to interrupt the power to said



cable in response to the absence of said predetermined output from either one of said phase locked loop means, so that said switch means interrupts the power to the cable when the improper monitor signal is received even if one said phase locked loop means is defective, said circuit means comprising two switch means connected in series, a different one of said phase locked loop means being connected to each of said switch means, each of said switch means comprising means for becoming electrically an open circuit responsive to the absence of said predetermined output from the phase locked loop means to which it is connected, and said series combination of switch means being connected between a source of voltage and said power switch means so that current supply to said power switch means is interrupted when said predetermined output is absent from either one or both of said phase locked loop means.

4,153,924

INRUSH CURRENT RESTRAINT CIRCUIT FOR ALTERNATING POWER SYSTEM SWITCH

Richard J. Moran, Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Oct. 12, 1977, Ser. No. 841,347

Int. Cl.[2] H02H *3/08*

U.S. Cl. 361—94 **18 Claims**

1. In an overcurrent protective device coupled to an electrical system, and including

a main switch,

switch opening means,

current signal generating means, coupled to said system, for producing an input current signal proportional to a current of said system,

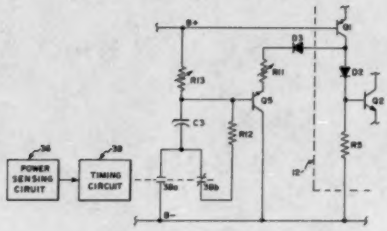
a current sensing means, connected to receive said input current signal, for producing a first voltage signal proportional to said input current signal,

overcurrent detection means, connected across said current sensing means to receive said first voltage signal, for producing an overcurrent pickup signal whenever said first voltage signal exceeds a predetermined minimum pickup value, and

actuating means, connected to receive said overcurrent pickup signal, for actuating said switch opening means upon receipt of said overcurrent pickup signal, the combination which comprises:

a voltage signal generating means for producing a second voltage signal having an initial predetermined rising voltage-time characteristic from the time said voltage signal generating means is actuated until said second voltage signal rises to a value at least as high as said pickup value of said first voltage signal;

energization sensing means, coupled to said system, for actuating said voltage signal generating means when said system is energized; and



a current path connected in parallel with said current sensing means, for diverting at least a portion of said input current signal from said current sensing means, which includes

a voltage follower amplifier means having an input connected to receive said second voltage signal and an output connected in said parallel current path, for coupling said voltage signal generating means to said parallel current paths so that the voltage of said amplifier output, which follows and is approximately equal to said second voltage signal, opposes said first voltage signal, and

rectifier means for preventing reverse breakdown of said voltage follower amplifier and subsequent reverse current flow in said parallel current path when said second voltage signal exceeds said first voltage signal;

whereby, when said system is energized following a period of de-energization, said overcurrent detection means is inactivated for a time interval determined by said second voltage signal.

4,153,925

DIELECTRIC FORMED BY A THIN-LAYER POLYMER, A PROCESS FOR PRODUCING SAID LAYER AND ELECTRICAL CAPACITORS COMPRISING THIS DIELECTRIC

Maryse Gazard, and Jean-Claude Dubois, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 6, 1978, Ser. No. 875,575
Claims priority, application France, Feb. 8, 1977, 77 03477
Int. Cl.[2] H01G *4/18;* **B05D** *3/06, 5/12*
U.S. Cl. 361—323 **4 Claims**

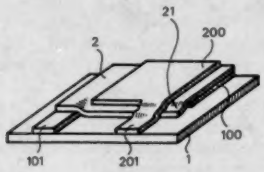
1. A process for producing a dielctric thin layer consisting of polymerized perfluoro-2-butene, comprising the steps of:

(a) introducing into a glow discharge apparatus a substrate intended to receive said dielectric layer and monomeric perfluoro-2-butene in the gaseous phase;

(b) reducing the pressure of said gaseous phase in the range from 0.05 to 0.3 Torr in said apparatus;

(c) creating a glow discharge under an a.c voltage of frequency ranging from 25 c/s to 15 Mc/s;

(d) maintaining the glow discharge for a period of time calculated as a function of the rate of formation of the



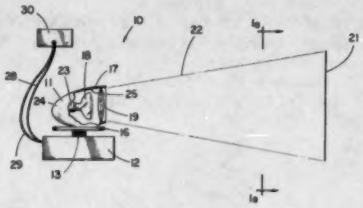
layer, said rate being from 4000 to 7000 Angstroms per minute.

4,153,926

CYCLIC ILLUMINATION DEVICE

Jackson D. Hurt, 3023 W. Morris St., Indianapolis, Ind. 46241

Filed Feb. 28, 1977, Ser. No. 772,542
Int. Cl.[2] F21V *21/30*
U.S. Cl. 362—35 **5 Claims**



1. A lighting apparatus for illumination of a surface which comprises:

a plurality of light fixtures, each of said plurality producing concentrated light simultaneously;

said plurality of light fixtures being arranged in a circular array such that the angular separation between adjacent light fixtures is substantially the same; and

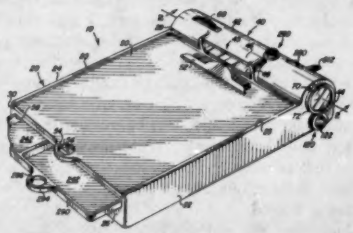
means for rotating said circular array of said plurality of light fixtures such that said concentrated light from each of said light fixtures moves along a path at a rate equal to at least the cycles per second rate defined by the expression (1/n) (10) wherein n equals the number of light fixtures of said circular array.

4,153,927

MULTI-FUNCTION CLIPBOARD APPARATUS

Ossie E. Owens, 2515 S. Mountain Ave., Phoenix, Ariz. 85040

Filed Aug. 17, 1977, Ser. No. 825,406
Int. Cl.[2] F21V *33/00;* **F41G** *1/34*
U.S. Cl. 362—99 **14 Claims**



1. Multi-purpose clipboard apparatus for law enforcement personnel, comprising, in combination:

base means, including

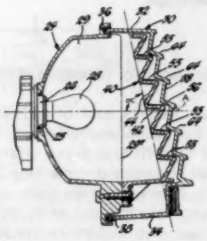
first and second side walls,
a lower end wall,
a forward portion,
a bottom,
a plurality of interior walls defining, with the first and second side walls, the lower end wall, the forward portion, and the bottom, a plurality of storage compartments, and
a top for providing a writing surface and movable to provide access to the storage compartments;
tray means disposed beneath the top of the base means and movable in the base means,
light means for providing illumination for the base means, including a first light means for illuminating the top and a second light means defining a spotlight shining away from the base means; and
gun means disposed in the forward portion for firing a cartridge generally parallel to the second light means, and trigger means for firing the gun means extending externally of the base means.

4,153,928

MOTOR VEHICLE TAIL LAMP ASSEMBLY

Guido C. Speedy, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1977, Ser. No. 855,827
Int. Cl.[2] F21V *5/04, 13/00;* **B60Q** *1/30*
U.S. Cl. 362—331 **3 Claims**



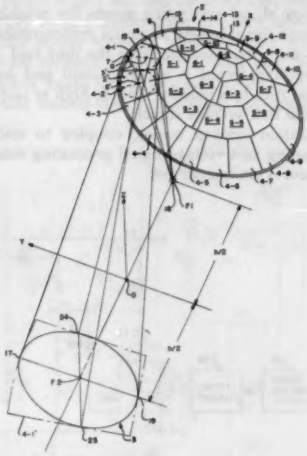
1. A lens assembly for a vehicle lighting unit that includes a housing provided with a reflector and a light bulb, said lens assembly comprising an outer lens and an inner lens connected to said housing opposite said reflector, said outer lens being made of a neutral density plastic material having a light transmitting factor in the range of 30% to 70%, the inner lens being located adjacent the outer lens and being made of a colored plastic material, said inner and outer lenses having a plurality of horizontal ribs, each of said ribs of said inner lens being V-shaped and consisting of a substantially horizontally oriented first portion and an inclined second portion, said inclined second portion having a front planar surface adjacent the outer lens and a rear planar surface facing said refelector, a plurality of optical surfaces formed on the rear planar surface for directing light emitted by said light bulb through said outer lens in a direction normally intercepted by a person viewing said lighting unit, the front planar surface lying in a plane which forms an included angle in the range of 25° to 35° with a vertical plane, said first portion having an upper planar surface and a lower planar surface, one of said planar surfaces of said first portion being coated with a dark color so as to render it opaque, said outer lens and said inner lens together with said coated planar surface cooperating so as to give the appearance of a substantially black lighting unit when said light bulb is not lighted while allowing the color of the inner lens to be transmitted through the outer lens when the light bulb is lighted.

4,153,929

LIGHT ASSEMBLY

W. Philip Laudenschlarger, Los Altos; Richard K. Jobe, and Richard P. Jobe, both of Los Altos Hills, all of Calif., assignors to Meddev Corporation, Los Altos, Calif.

Filed Oct. 20, 1976, Ser. No. 734,001
Int. Cl.[2] F21V *7/09*
U.S. Cl. 362—348 **12 Claims**



1. A light assembly comprising,
a reflector formed by a plurality of facets, said reflector formed about an imaginary spheroid surface defined by an ellipse of revolution having a first focus and a second focus along a major axis, said facets arrayed opposite said first focus so that a central point of each facet is substantially a tangent point on said spheroid surface, said facets constructed with outer bounds correlated to the size of an illuminated area,
a light source located at said first focus for radiating light to said reflector to form said illuminated area in a plane normal to said major axis at said second focus whereby the light reflected from the outer bounds of each of said facets forms the outer bounds of the illuminated area.

4,153,930

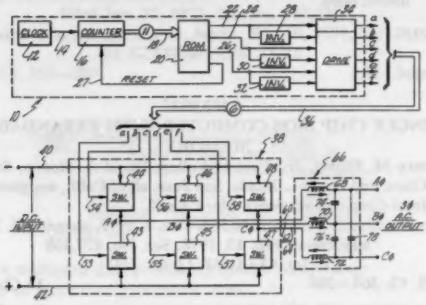
BALANCED CONTROL WAVEFORM FOR REDUCING INVERTER HARMONICS

Daniel J. Marceau, Springfield, Mass., and Robert M. Moriarty, Tolland, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 20, 1977, Ser. No. 843,930
Int. Cl.[2] H02M *1/14*
U.S. Cl. 363—42 **9 Claims**

1. A power inverter for converting electrical energy from a DC source to a substantially sinusoidal waveform having a positive-going half cycle and a negative-going half cycle, comprising:
input means for receiving DC electrical energy from a source having a negative and positive input signal,
switch means capable of being reduced conductive and non-conductive in response to the state of an actuating signal applied to a control terminal,
control means connected to said switch means for generating a repetitive waveform from which said actuating signal is derived, said repetitive waveform including notches disposed at the beginning and end portions thereof which are adapted to actuate said switch means in such a manner as to form a fundamental of said sinusoidal

waveform together with certain lower order harmonics and other higher order harmonics, and



filter means coupled to said switching means for removing the higher order harmonics thereby rendering said fundamental signal substantially sinusoidal.

4,153,931

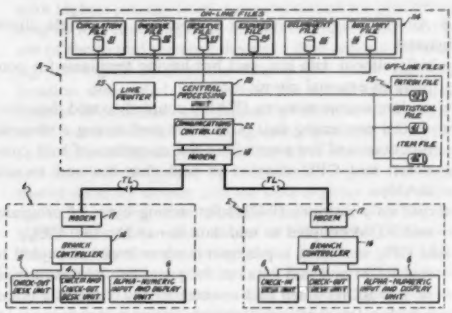
AUTOMATIC LIBRARY CONTROL APPARATUS

Wendel C. Green, Annandale, Va.; Russell E. Cunningham, Washington, D.C.; Gordon S. Light, Chevy Chase, Md.; Patrick J. Sharkitt, and Charles W. Webster, both of Silver Spring, Md., assignors to Sigma Systems Inc., Arlington, Va.

Continuation of Ser. No. 366,928, Jun. 4, 1973, abandoned, which is a continuation of Ser. No. 144,197, May 17, 1971, abandoned. This application Nov. 6, 1974, Ser. No. 521,468

Int. Cl.[2] **G06F** *3/04, 7/22, 15/06, 15/40*

U.S. Cl. 364—200 **11 Claims**



1. A data processing system for use in a library in controlling the circulation of items and checking the status of users and items, said system having computer means coupled to data storage means, said data storage means having circulation storage locations and status storage locations, said system comprising:

a unique circulation storage location for each said item of said library,

at least one circulation station within said library having reading means for reading machine readable label means,

means for coupling said computer means to said circulation station,

machine readable label means secured to each item for identifying said item,

machine readable means for identifying said user,

means for storing in status storage locations of said data storage means:

data signals corresponding to a delinquent status of a user label means, and

data signals corresponding to an overdue status of an item label means,

said reading means, upon reading a user identifying label means, generating electrical user identifying data signals,

said reading means, upon reading an item identifying label means, generating electrical item identifying data signals,

means for directly accessing a user status storage location in said data storage means said user status storage location having an address directly determined by said user identifying data signals,

means for generating on-line a user status signal responsive to data in said directly accessed user status storage location, said user status signal corresponding to a delinquent status of said user label means,

means responsive to said user status signal for storing on-line at a specified address of said circulation storage locations of said data storage means representations of said user identifying data signals from said recording means, said circulation storage locations address directly specified from said item identifying data signals and being in one-to-one correspondence therewith, whereby each specified address corresponds to a unique one of said items of said library,

means for directly accessing an item status storage location in said data storage means, said item status storage location having an address directly determined by said item identifying data signals from said reading means,

means for generating on-line an item status signal responsive to data in said directly accessed item status storage location, said item status signal corresponding to an overdue status of said item,

means responsive to said item status signal for directly accessing specified address of said circulation storage locations of said data storage means, said specified circulation storage locations address directly determined by said item identifying data signals from said reading means, and

means for deleting from said specified address of said circulation storage locations said corresponding representations of said user identifying data signals,

whereby an on-line circulation file is maintained for associating library users and items and for providing on-line delinquent and overdue status checks.

4,153,932

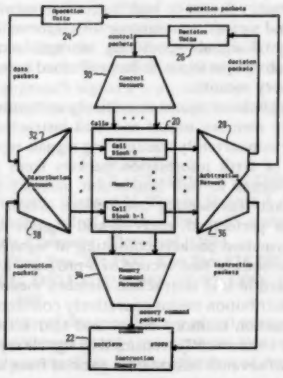
DATA PROCESSING APPARATUS FOR HIGHLY PARALLEL EXECUTION OF STORED PROGRAMS

Jack B. Dennis, Belmont, and David P. Misunas, Brighton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 456,488, Mar. 29, 1974, Pat. No. 3,962,706. This application Aug. 19, 1975, Ser. No. 605,932

Int. Cl.[2] **G06F** *3/00, 13/00;* **G06K** *17/00*

U.S. Cl. 364—200 **17 Claims**



1. A digital data processor comprising:

(a) active memory means for holding at least a record of active instructions, said active memory means containing a plurality of cells, each cell holding one instruction of said record of active instructions and each cell having a unique cell index addressable by a destination address;

(b) instruction memory means for holding at least a record of a program, said instruction memory means holding all instructions comprising said record of a program and each instruction having a unique instruction index;

(c) operation means for managing signals in the execution of arithmetic and logical operations on signals representing data values including at least a destination address and a computed value.

(d) decision means for managing signals in the execution of comparison and testing operations on signals representing Boolean and control values;

(e) first arbitration means operatively connected between said active memory means and said operation means and operatively connected between said active memory means and said decision means for concurrently transmitting signals representing a plurality of first information packets from said active memory means to said operation means and for concurrently transmitting signals representing a plurality of second information packets from said active memory means to said decision means, each of said signals representing first information packets and each of said signals representing second information packets consisting of signals representing an instruction of said record of active instructions together with all critical data values required for its execution;

(f) control means operatively connected between said decision means and said active memory means for concurrently transmitting signals representing a plurality of third information packets from said decision means to said active memory means, each of said signals representing third information packets consisting of signals representing Boolean and control values computed by said decision means and required for the execution of said record of active instructions contained in said cells of said active memory means;

(g) first distribution means operatively connected between said operation means and said active memory means for concurrently transmitting signals representing a plurality of fourth information packets from said operation means to said active memory means, each of said signals representing fourth information packets consisting of signals representing data values computed by said operation means and required for execution of each of said active instructions contained in said active memory means at its corresponding destination address;

(h) memory command means operatively connected between said active memory means and said instruction memory means for concurrently transmitting signals representing a plurality of fifth information packets from said active memory means to said instruction memory means, each of said signals representing fifth information packets consisting of signals specifying storage, retrieval, and administrative operations to be performed by said instruction memory means;

(i) second arbitration means operatively connected between said active memory means and said instruction memory means for concurrently transmitting signals representing a plurality of sixth information packets from said active memory means to said instruction memory means said sixth packet representing instructions whose operations have been performed, each of said signals representing sixth information packets consisting of signals representing instructions of said record of a program to be temporarily stored in said instruction memory means; and

(j) second distribution means operatively connected between said instruction memory means and said active memory means for concurrently transmitting signals representing a plurality of seventh information packets from said instruction memory means to said active memory means, each of said signals representing seventh information packets consisting of signals representing instructions of said record of a program being conveyed to said active memory means to become instructions of said record of active instructions.

4,153,933

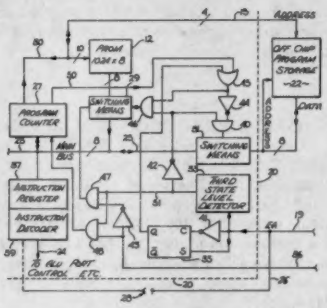
SINGLE CHIP MOS COMPUTER WITH EXPANDABLE MEMORY

Henry M. Blume, Jr., Portola Valley; David A. Stamm, Santa Clara, and David L. Budde, San Jose, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 636,535, Dec. 1, 1975, abandoned. This application Feb. 13, 1978, Ser. No. 877,108

Int. Cl.[2] G06F *13/00, 7/48*

U.S. Cl. 364—200 **13 Claims**



1. An MOS digital computer comprising, on a single silicon substrate:

a bidirectional data bus, said bus having terminals for coupling to external circuit means;

a random-access memory (RAM) coupled to said data bus;

a central processing unit (CPU) for performing arithmetic functions and for controlling the operation of said computer, said CPU coupled to said data bus and to said RAM;

a read-only memory (ROM) for storing bytes of program, said ROM coupled to said data bus and to said CPU;

said CPU including a program counter means, coupled to said ROM and said data bus for providing address signals to said ROM when said counter means contains a count which is less than a predetermined count, and for providing address signals to external memory when said counter means contains a count which exceeds said predetermined count;

input detection means for receiving first and second externally applied predetermined signals for testing of said computer and for providing control signals to said program counter means and said ROM, said control signals for causing coupling of instructions from such external memory to said data bus independent of the count contained within said counter means when said first predetermined signal is received by said input detection means, and for causing said ROM to be coupled to said data bus such that said program stored in said ROM may be externally examined when said second predetermined signal is received by said input detection means;

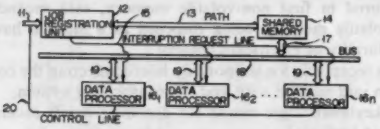
whereby the program storage capacity of said computer may be expanded by use of external memory which is automatically addressed by signals from said program counter means, and whereby said ROM and CPU may be separately tested.

4,153,934

MULTIPLEX DATA PROCESSING SYSTEM

Masayuki Sato, Ohme, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 27, 1977, Ser. No. 763,244
Claims priority, application Japan, Feb. 10, 1976, 51/12810
Int. Cl.[2] G06F *9/18, 15/16*
U.S. Cl. 364—200 **12 Claims**



1. A multiplex data processing system comprising:

two or more data processing units;

a shared memory device connected to the data processing units for storing data processed by any one of the data processing units; and

a job registration unit connected to the shared memory device for accepting and storing job request information including priority order information for determining the priority level of the job request information, for transferring the job request information with the determined priority level to the shared memory device and for supplying an interrupt signal to the data processing units to control the data processing units so that they execute jobs according to the job request information stored in the shared memory device; said job registration unit comprising a memory circuit for storing job request information, an address generator for generating an address signal which designates a memory location of the shared memory device corresponding to the job request information with highest priority level, a request circuit for generating a signal for requesting from the shared memory device the use of the shared memory device, a data register for storing the logical sum of the data stored in the memory location designated by the address signal and the job request information with highest priority level, a read/-write control circuit for designating any one of a read cycle for reading each information bit of data at the memory location designated by the address signal from the shared memory device into the data register and a write cycle for writing the respective information bit of the logical sum of the data stored in the memory location designated by the address signal and the job request information with highest priority level from the data register into the shared memory device, an interrupt signal generator responsive to the writing from the data register into the shared memory device for generating an interrupt signal which is applied to the data processing units to cause the job to be executed by the interrupted data processor indicated by the job request information which is stored in the shared memory device, and a sequence control circuit for controlling the memory circuit, address generator, request circuit, read/write control circuit, data register and interrupt signal generator.

4,153,935

NAVIGATIONAL AID

Keith D. Jones, Thingwall; Geoffrey R. Cowap, Newburgh, both of England, and Mark R. Bradshaw, Buckley, Wales, assignors to Grundy & Partners Limited, Stonehouse, England

Filed Jan. 25, 1977, Ser. No. 762,794
Int. Cl.[2] G01S *9/44*
U.S. Cl. 364—461 **6 Claims**

1. A collision avoidance apparatus for determining the nearest approach distance of a first vessel with respect to a second vessel comprising:

means for generating a first signal u proportional to the present speed of said first vessel,

means for generating a second signal v proportional to a selected change in speed of said first vessel,

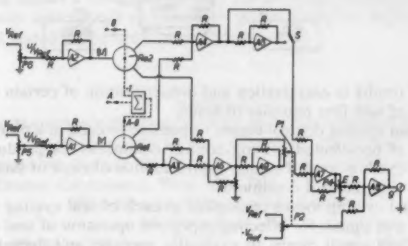
means for generating a signal proportional to the present nearest approach distance P,

means for generating a signal proportional to the inverse of the present distance R between said first and second vessels,

first means for multiplying said first speed proportional signal u by the sine of the angle θ between the direction of travel of said first vessel and the direction to said second vessel to derive a signal proportional to u Sine θ,

second means for multiplying said speed proportional signal u by the cosine of the angle θ to derive a signal proportional to u cos θ,

third means for multiplying said second speed proportional signal v by the sine of the difference angle between the angle A defining the selected change in course direction and the angle θ to derive a signal proportional to v sin $(A-\theta)$,



fourth means for multiplying said second speed proportional signal by the cosine of said difference angle to derive a signal proportional to v cos $(A-\theta)$,

first summing means for generating the sum of the signals proportional to u sin θ+v sin $(A-\theta)$,

second summing means for generating a signal proportional to u cos θ−v cos $(A-\theta)$,

fifth means for multiplying said signal proportional to [u cos θ−v cos $(A-\theta)$] and P/R,

means for adding said signals proportional to u sin θ and v sin $(A-\theta)$,

third summing means responsive to said adding and said fifth multiplying means for deriving a signal proportional to $(P/R)[u \cos \theta - v \cos (A-\theta)]+[u \sin \theta + v \sin (A-\theta)]$, said signal being equal to y,

sixth means for multiplying the time t during which said selected change in speed and course direction takes place by y to thereby generate the signal yt,

means for adding the signal proportional to the present nearest approach distance P to yt to thereby generate a nearest approach signal P+yt, and

means for displaying said nearest approach signal.

4,153,936

ENERGY MANAGEMENT SYSTEM

William D. Schmitz; Richard H. Turpin; Robert A. Dashiell, and Chris L. Hadley, all of Indianapolis, Ind., assignors to Reliance Electric Company, Cleveland, Ohio

Filed Sep. 26, 1977, Ser. No. 836,563
Int. Cl.[2] H02J *3/00;* **G05B** *19/00;* **G06F** *15/56*
U.S. Cl. 364—493 **15 Claims**

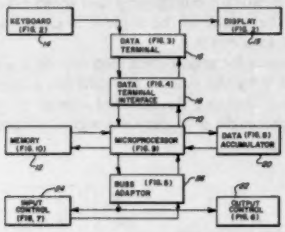
1. For a facility of the type having plural energy consuming loads, a self-contained energy management system for sensing and selectively controlling the energization of said loads comprising:

means coupled to each of a first plurality of said loads for

producing control signals to selectively energize and deenergize each of said first plurality of loads;

means coupled to each of a second plurality of said loads for selectively sensing the state of energization of each of said second plurality of loads and for producing sensing signals indicative of the state of energization of each of said second plurality of loads;

means responsive to production of selected ones of said sensing signals representative of selected preset conditions for effecting operation of said control signal means to produce selected ones of said control signals as a function of the selected sensing signal produced, whereby the existence of each of said plurality of preset conditions



results in energization and deenergization of certain ones of said first plurality of loads;

load cycling control means responsive to each of a plurality of preselected cycling control conditions for producing cycling control signals representative of each of said cycling control conditions;

load cycling means responsive to each of said cycling control signals for effecting repetitive operation of said control signal means to cyclically energize and deenergize selected ones of said first plurality of loads in cycling patterns determined in response to said load cycling control signal; and

means for modifying each of said cycling patterns in response to additional preselected conditions.

4,153,937

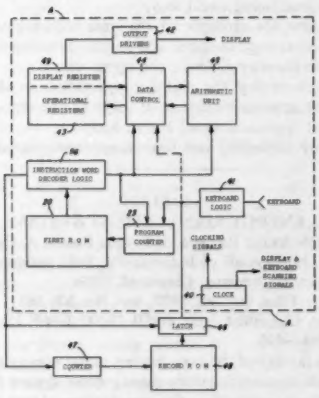
MICROPROCESSOR SYSTEM HAVING HIGH ORDER CAPABILITY

Sydney W. Poland, Arlington, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 714,464, Aug. 16, 1976. This application Apr. 1, 1977, Ser. No. 783,903

Int. Cl.[2] G06F *3/08, 15/02*

U.S. Cl. 364—706 **27 Claims**



1. In an electronic microprocessor system, having a keyboard, output means for outputting data, a data memory for storing data, an arithmetic unit for performing arithmetic operations on the data stored in said data memory, and a first non-volatile memory for storing groups of instructiion words for controlling the arithmetic operations performed by said arithmetic unit, the combination which comprises:

(a) a second non-volatile memory for storing a plurality of sets of program codes, each program code being effective for addressing a preselected group of instruction words stored in first non-volatile memory, said second non-volatile memory being disposed in a module having a plurality of electrical contacts;

(b) a receptacle for temporarily interconnecting the contacts on said module with said microprocessor system;

(c) keyboard logic means for decoding inputs received at said keyboard;

(d) means for addressing said second non-volatile memory to read out preselected sets of program codes, said means for addressing said second memory including a counter responsive to selected instructions outputted from said first memory;

(e) means for addressing said first non-volatile memory in response to the program codes read out of said second non-volatile memory, said means for addressing said first memory including a first program counter selectively responsive to said keyboard logic means and said program codes outputted from said second memory.

4,153,938

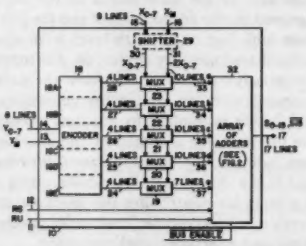
HIGH SPEED COMBINATORIAL DIGITAL MULTIPLIER

Robert C. Ghest, Saratoga; Hua-Thye Chua, Cupertino, and John M. Birkner, Santa Clara, all of Calif., assignors to Monolithic Memories Inc., Sunnyvale, Calif.

Filed Aug. 18, 1977, Ser. No. 825,648

Int. Cl.[2] G06F *7/52*

U.S. Cl. 364—760 **21 Claims**



1. A digital multiplier having a plurality of multiplier inputs and a plurality of multiplicand inputs comprising:

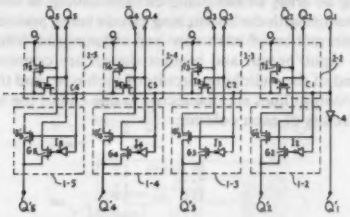
first means responsive to three of said multiplier inputs for producing a selection signal representative of logic levels applied to said three multiplier inputs; and

second means responsive to two adjacent ones of said multiplicand inputs and responsive to said selection signal for producing an output signal representative of one of said adjacent multiplicand inputs or the complement of one of said adjacent multiplicand inputs determined by said selection signal.

4,153,939
INCREMENTER CIRCUIT

Eiichi Kudou, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 762,004, Jan. 24, 1977, abandoned. This application Feb. 9, 1978, Ser. No. 876,311
Claims priority, application Japan, Jan. 24, 1976, 51-6363
Int. Cl.[2] G06F *7/50*
U.S. Cl. 364—770 **4 Claims**



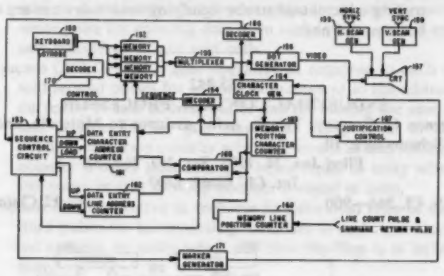
1. An incrementer circuit comprising first to m-th (where m is an integer of 2 or more) input terminals for receiving first to m-th digit binary input signals respectively, first to m-th output terminals for deriving first to m-th digit binary output signals respectively, first means for generating a first carry signal, second to (m−1)th means for generating second to (m−1)th carry signal respectively, the h-th (where h denotes each of the integers from 2 to m−1) carry signal generating means including a first insulated-gate field effect transistor, the gate and one of the source and drain of said first field effect transistor being supplied with said h-th digit input signal and with the (h−1)th carry signal respectively, a second insulated-gate field effect transistor, the gate and one of the source and drain of said second field effect transistor being supplied with the inverted signal of said h-th digit input signal and with a reference voltage corresponding to a "0" binary signal respectively, a carry signal output terminal connected to the other of the source and drain of said first transistor and the other of the source and drain of said second transistor in common, a first transfer gate circuit for transferring the inverted signal of said first digit input signals to said first output terminal, and second to m-th gating means, the k-th (where k denotes each of the integers from 2 to m−1) gating means including a third insulated-gate field effect transistor for transferring the k-th digit input signal to said k-th output terminal in response to a "0" binary signal of the (k−1)th carry signal and a fourth insulated-gate field effect transistor for transferring the inverted signal of said k-th digit input signal to said k-th output terminal in response to a "1" binary signal of the (k−1)th carry signal.

4,153,940
ELECTRONIC TYPOGRAPHIC APPARATUS

William R. Grier, New Vernon; Francis H. Shepard, Jr., Summit, and Arthur L. Arledge, Basking Ridge, all of N.J., assignors to Realty & Industrial Corporation, Morristown, N.J.

Division of Ser. No. 622,172, Oct. 14, 1975, Pat. No. 4,054,948. This application Aug. 1, 1977, Ser. No. 820,901
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—711 **9 Claims**

1. A combined typographical display apparatus comprising a display system including a display device and means for displaying on said display device a plurality of lines of characters, a keyboard having a plurality of keys, means selectively responsive to the operation of said keys for producing coded signals, proportional character generating means responsive to said coded signals for displaying proportional characters corresponding to the operation of said keys in one of said lines, means for producing a coded signal corresponding to a carriage return, and means responsive to said carriage return signal for displacing characters displayed in said given line to another line, said proportional character generating means comprising (i) a memory for storing said coded signals, (ii) means responsive to a series of successive stepping signals for sequentially reading each of said coded signals from said memory, and (iii) means responsive to each coded signal read from

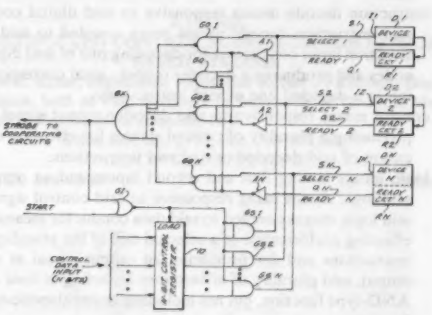


said memory for generating a corresponding one of said stepping signals a time interval after the previous stepping signal which corresponds to the width of the character defined by said coded signal read from said memory.

4,153,941
TIMING CIRCUIT AND METHOD FOR CONTROLLING THE OPERATION OF CYCLICAL DEVICES

Richard W. Caddell, Brookfield, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Nov. 11, 1976, Ser. No. 740,795
Int. Cl.[2] G06F *1/04*
U.S. Cl. 364—900 **19 Claims**



1.

A method of operating any number of a plurality of devices each of which is operable when actuated to execute a cycle of operation, comprising the steps of:

(A) generating electrical control data signals signifying which devices are selected to be actuated at a given time;

(B) actuating the selected devices after said control data signals have been generated;

(C) generating an electrical ready signal for each actuated device after a cycle of operation thereof has been completed and the device is ready to commence a subsequent cycle of operation;

(D) comparing said ready signals with said control data signals in an electrical comparator circuit to determine when the last ready signal for the actuated devices has been generated;

(E) generating the leading edge of an electrical strobe after said last ready signal has been generated to signify that all of the selected devices have completed a single cycle of operation;

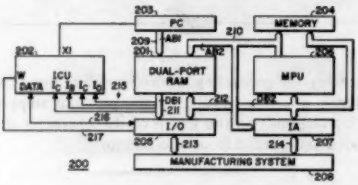
(F) resetting said ready signals before said strobe is terminated;
(G) generating the trailing edge of said strobe after all of said ready signals have been reset; and
(H) generating further control data signals in response to the trailing edge of said strobe signifying which devices are to be operated next.

4,153,942

INDUSTRIAL CONTROL PROCESSOR

Vernon C. Gregory, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 24, 1977, Ser. No. 761,738
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—900 **12 Claims**



11. A one-bit digital control unit for executing a plurality of instructions comprising:

data conductor means for conducting data to and from said digital control unit;

a plurality of instruction input conductors for conducting any one of a plurality of digital codes each representative, respectively, of said instructions to said digital control unit;

instruction decode means responsive to said digital codes, said instruction decode means being coupled to said instruction input conductors for decoding one of said digital codes and producing a decoder output signal corresponding to a decoded one of said instructions;

control means responsive to said decoder output signal for producing a plurality of control signals for effecting execution of said decoded one of said instructions;

logic means having first and second inputs and an output, said logic means being responsive to said control signals, said logic means coupled to said data conductor means for effecting performance of a selected one of the plurality of instructions and for producing an output signal at said output, said plurality of instructions including at least and AND-type function, but not including any arithmetic-type functions;

storage outputs means responsive to said control means and coupled to said output of said logic means and to said second input, said storage output means being for storing information representative of said output of said logic means;

means responsive to said storage output means for selectively coupling an output of said storage output means to said first input of said logic means.

4,153,943

HIGH SPEED I/O FOR CONTENT ADDRESSABLE TYPE MEMORIES

George A. Anderson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 12, 1977, Ser. No. 824,007
Int. Cl.[2] G06F *13/00, 3/00*
U.S. Cl. 364—900 **7 Claims**

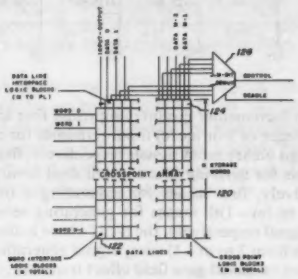
1. A data switching system having the internal capacity to selectively connect each of a plurality of input/output lines on one side of the system to any one of a plurality of available input/output lines on another side of the system, said system comprising:

N word input/output lines where N is greater than **1**;

M data input/output lines where M is greater than **1** and $M \leqq N$;

request means for selecting n word input/output lines for data transfer, where $0 \leqq n \leqq N$;

switching means for connecting each of the n selected word input/output lines to one of n data input/output lines to permit parallel data transfer, said switching means comprising an array of switching circuits having N rows and M columns with each switching circuit being positioned at the intersection of each row and column and where the word input/output and request signals are connected to one end of the switching circuits of each row, and the data input/output lines are connected to one end of the switching circuits of each column;



enable means for indicating to the switching means the identity of the first data input/output line to which one of the word input/output lines may be connected, said enable means being connected to one end of the switching circuits of each column;

means for propagating a request signal along a row until the request signal reaches a switching circuit intersection at which the enable signal is present;

means for propagating the enable signal along a column until it reaches an intersection at which a request signal is present; and

means for connecting a word input/output line and the data input/output line corresponding to the switching intersection at which the enable signal and a request signal are present.

4,153,944

METHOD AND ARRANGEMENT FOR BUFFERING DATA

James A. Grandle, Jr., Marlboro, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 12, 1973, Ser. No. 414,763
Int. Cl.[2] G06F *7/00, 13/06*
U.S. Cl. 364—900 **1 Claim**

1. A data buffer for buffering data from N data sources comprising

an input channel counter **(201)**,

an output channel counter **(130)**,

a loop counter **(220)**,

a subloop counter **(225)**,

an address buffer **(215)**,

first and second mode flip-flops **(111, 112)** each having a clear state and a set state,

signal lead means (GO) for receiving a start pulse, said start pulse clearing the count in said input channel counter to zero and incrementing the count in said output channel counter by unity,

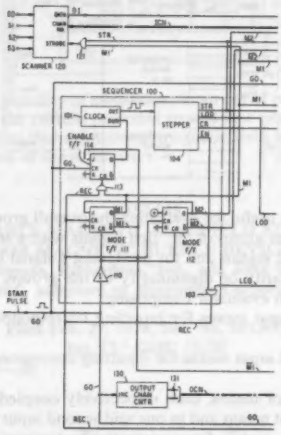
inverter means **(110)** operative in response to said start pulse for establishing each of said flip-flops in its clear state,

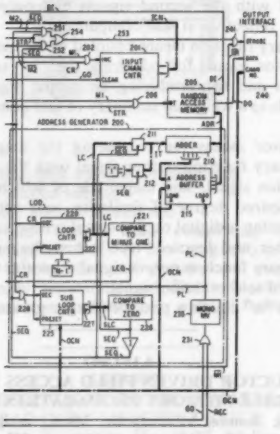
first circuit means **(231, 235)** including a monstable multivi-

brator and operative in response to said start pulse for presetting the count in said loop counter to $N-1$, presetting the count in said subloop counter to said output channel number and loading the count in said output channel counter into said address buffer,

second circuit means (**101, 104, 114**) operative subsequent to the operation of said first circuit means for repetitively generating sequences of first, second, third and fourth pulses,

output strobe means (**226, 241, 251, 252, 254**) operative for generating an output interface strobe pulse in response to indiviual ones of said first pulses when said first and second flip-flops are in their clear states and the count in said





subloop counter is zero, said output strobe means being further operative when said first flip-flop is in its clear state, said second flip-flop is in its set state, and the count in said subloop counter is other than zero,

input strobe means (**121, 206**) operative for generating an input strobe pulse and a memory write pulse in response to individual ones of said first pulses when said first flip-flop is in its set state,

a data input lead (**DI**),

scanner means (**120**) operative in response to said input strobe pulse for providing on said data input lead data derived from an individual one of said sources identified by the count in said input channel counter,

a random access memory (**205**) comprised of $(N^2+N)/2$ memory cells, each of said cells having an address which is a respective one of the integers 0 through $[(N^2+N)/2]-1$, said memory providing as an output the contents of an individual one of its memory cells having as its address the address currently in said address buffer, said memory being operative in response to said memory write pulse for entering data from said data input lead into said individual one of said cells,

means (**210, 211, 212, 226**) operative in response to each of said second pulses for adding an increment to the address currently in said address buffer and for storing the sum in said address buffer, said increment being equal to the count in said loop counter when the count in said subloop counter is other than zero and being equal to unity when the count in said subloop counter is equal to zero,

means (**202**) operative in response to individual ones of said third pulses for incrementing the count in said input channel counter by unity when said first flip-flop is in its set state,

means (**226, 228**) operative in response to individual ones of said third pulses for decrementing the count in said subloop counter by unity if it is not equal to zero, each of said third pulses also decrementing the count in said loop counter by unity,

means (**103, 221**) operative in response to individual ones of said fourth pulses for generating a recycle pulse when the count in said loop counter is equal to negative unity, said recycle pulse operating said first circuit means, switching the stage of said second flip-flop, and switching the state of said first flip-flop if said second flip-flop was in its set state prior to the generation of said recycle pulse, and

means (**113**) operative in response to said recycle pulse for inhibiting further operation of said second circuit means if said first flip-flop was in its set state prior to the generation of said recycle pulse.

4,153,945

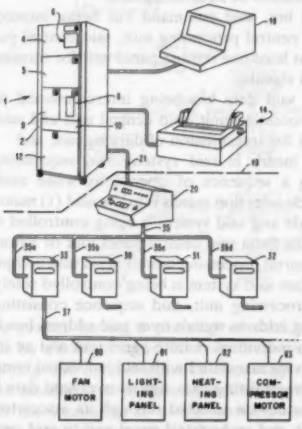
MULTIPLEXED CONTROL SUBSYSTEM FOR SENSOR BASED SYSTEMS

Elliot J. Actor, Lighthouse Point, and Robert F. Kantner, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1977, Ser. No. 807,841

Int. Cl.[2] **G06F** *3/00, 11/00*

U.S. Cl. 364—900 **9 Claims**



1. A sensor based system for monitoring sensor devices and issuing commands comprising:

a central processing unit, said central processing unit having program facilities, storage facilities and sensor interface facilities and said central processing unit further having

address signal generating and command signal generating facilities as well as data signal analysis facilities;

a central panel unit, said central panel unit and said central processing unit being operable to control said system on a mutually exclusive and independent basis, said central panel unit having manual address signal generating means, manual command signal generating means, mode selection means for selecting at least (1) a manual/computer mode, wherein said system is controllable manually by an operator from said central panel unit or automatically by said central processing unit but on a mutually exclusive basis and (2) a computer only mode wherein said system is controlled solely by said central processing unit, said central panel unit further having first indication means for indicating addresses manually selected and second indication means for manifesting sensor status (data) indications;

system priority means operable when said mode selection means is in the manual/computer mode to enable control either by an operator from said central panel unit or by said central processing unit, but not both concurrently and said priority means having facilities for resolving attempts to simultaneously control the system from both said central processing unit and said central panel unit by establishing priority of computer addresses and commands over addresses and commands manually entered from said central panel unit, said priority means being further operable when said mode selection means is in the computer only mode to fully inhibit control from said central panel unit;

at least one remote panel unit, said remote panel unit having an associated plurality of addressable sensor input/output cards, said remote panel unit and each of said addressable sensor input/output cards having address decode circuits, command decode circuits, and data transmission circuits for use in conjunction with individual sensor devices interconnected with said sensor input/output cards, and said remote panel unit having address signal selection means for pre-establishing individual unique addresses for said remote panel unit and the sensor input/output cards associated with said remote panel unit;

an address bus, said address bus being interconnected with said central processing unit, said central panel unit and said at least one remote panel unit and its said associated input/output cards and said interconnected sensor devices for transmission of address signals;

a command bus, said command bus being interconnected with said central processing unit, said central panel unit, and said at least one remote panel unit for transmission of command signals;

a data bus, said data bus being interconnected with said central processing unit, said central unit and said remote panel unit for transmission of data signals; and

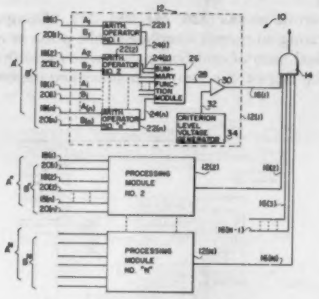
sequencing means in said system, said sequencing means providing a sequence of operations when said central panel mode selection means is in the said (1) manual/computer mode and said system is being controlled either by an operator from said central panel unit or automatically by said central processing unit or (2) in said computer only mode, when said system is being controlled solely by said central processing unit, said sequence consisting of (A) generating address signals over said address bus for selection of an individual remote panel unit and an individual sensor device associated with said individual remote panel unit (B) transmitting data signals over said data bus from the sensor device selected through its associated remote panel unit, and said central panel unit to said central processing unit (C) analyzing said data signals in said central processing unit (D) transmitting command signals over said command bus to said selected sensor device and (E) transmitting further data signals from said selected sensor device to said central processing unit.

4,153,946

EXPANDABLE SELECTION AND MEMORY NETWORK

Howard T. Upton, 2301 Glenallen Ave., Apt. 810, Silver Spring, Md. 20906

Filed Oct. 20, 1977, Ser. No. 844,046
Int. Cl.[2] G06F 7/04; G06K 9/00
U.S. Cl. 364—900 **18 Claims**



1. A circuit useful for evaluating the overall group similarity between a first group of "n" first signals with a second group of "n" second signals and for producing a signal based on the level of similarity or dissimilarity of the groups, said circuit comprising an evaluator comprising:

"n" first input means for inputting corresponding first signals;

"n" second input means for inputting corresponding second signals;

"n" operator means, each respectively coupled to one said first input means and to one said second input means, each operator means for quantitatively comparing the first signal with the second signals and outputting a signal result reflective of said comparison;

a summary function means coupled to the output of said "n" operator means for receiving the "n" said comparison results and for producing an output signal that corresponds to a weighted summary of said comparison results; and

comparitor means for comparing the magnitude of said summary function output signal with the magnitude of a criterion signal, said magnitude of which depends upon the desired degree of similarity, said comparitor means outputting a digital output signal whose value is based on whether, and denoted "true" when, the magnitude of said summary function output signal is greater than the magnitude of said criterion signal;

wherein "n" equals a positive integer greater than 1.

4,153,947

CONDUCTOR DRIVEN FIELD ACCESS MAGNETIC BUBBLE MEMORY PROPAGATION SYSTEM

G. Patrick Bonnie, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

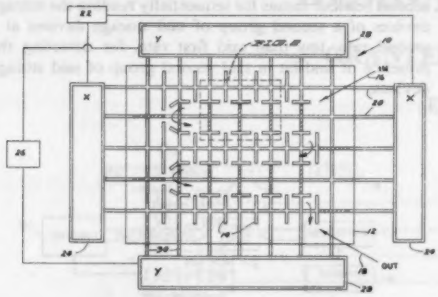
Filed Oct. 12, 1977, Ser. No. 841,507
Int. Cl.[2] G11C 19/08
U.S. Cl. 365—6 **3 Claims**

1. In a magnetic bubble memory device comprised of a magnetic substrate and a layer of material over said substrate having magnetic elements positioned thereon, the improvement comprising:

means for producing a magnetic field rotating in the same plane as the substrate and interacting with said magnetic elements consisting of a first plurality of conductors parallel to one another positioned directly over said magnetic elements and a second plurality of conductors parallel to one another and orthogonal to said first plurality of conductors positioned directly over said magnetic elements all of said conductors

having electrical terminations at each end so that current may be passed therethrough, and

means for providing a varying electrical current to said



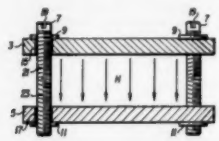
second plurality of conductors in an out of phase relationship to the current provided to said first plurality of conductors so that a rotational magnetic field is produced in the plane of the substrate.

4,153,948

ADJUSTABLE MAGNETIC BIAS FIELD STRUCTURE FOR MAGNETIC BUBBLE DEVICES

Magid Y. Dimyan, Richardson, Tex., and John C. Unger, San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 27, 1978, Ser. No. 881,492
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—28 **10 Claims**



1. Magnetic bias field apparatus comprising:

a first planar magnet means;

a second planar magnet means; and

magnetic spacer means each comprising opposingly threaded magnetic bolts of low magnetic permeability associated with said first and second planar magnet means for adjustably separating said first and second planar magnet means in a substantially parallel facing relationship.

4,153,949

ELECTRICALLY PROGRAMMABLE READ-ONLY-MEMORY DEVICE

John W. Rau, III, Escondido; Harold H. Muller, Carlsbad; Richard K. W. Tam, Poway, all of Calif., and Louis J. Kabell, Reno, Nev., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 813,001, Jul. 5, 1977. This application May 22, 1978, Ser. No. 907,918
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—104 **5 Claims**

1. A monolithic programmable semiconductor memory comprising a semiconductor ship,

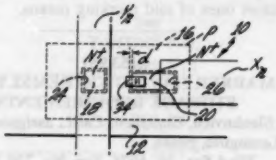
a plurality of electrically conductive paths arranged in rows on said chip,

a plurality of electrically conductive paths arranged in columns on said chip,

a plurality of electrically permanently alterable devices each having a current voltage characteristic prior to permanent alteration different from the current voltage characteristic subsequent to alteration each device being connected between a row path and a column path forming a matrix of permanently alterable devices,

means responsive to a code for permanently altering selective devices,

means on said chip for sensing the altered and non-altered



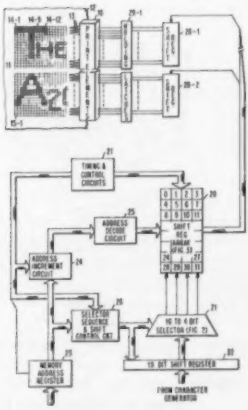
condition of the device, and wherein each of said devices comprises a section of a semiconductor chip including conductivity regions forming a PN junction by a washed emitter process close to a window one path connected to one region and the other path connected to another region on the other side of said junction, and a free metal piece electrically and physically contacting one region on one side of said junction but out of contact with said paths, and overlying one edge of said window and said one region.

4,153,950

DATA BIT ASSEMBLER

Eugene J. Nosowicz, Vestal, and Robert C. Pearson, Newark Valley, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,679
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—231 **11 Claims**



1. In a printer having a plurality of marking means each selectable by a control signal for recording a mark, apparatus for supplying said control signals comprising:

data bit assembler means having a plurality of storage cells, each corresponding to a said marking means, said cells being arranged in a matrix of rows and columns and addressable by rows for selective parallel storage of said data bits in the cells within a row, said plurality of cells being activatable for serial readout of data within each said row and said rows being readable in succession;

buffer means having a plurality of storage positions for receiving in parallel a plurality of said data bits;

buffer readout means connected between said cell columns and said buffer storage positions for applying thereto in parallel a predetermined group of bits in said plurality;

means for addressing predetermined rows for successively storing groups of bits appearing at said columns of cells; and

means for serially reading out the data bits within a said row and sequentially from said rows as control signals for respective ones of said marking means.

4,153,951

EVENT MARKER HAVING EXTREMELY SMALL BIT STORAGE REQUIREMENTS

George L. Sienkovich, Campbell, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Sep. 24, 1976, Ser. No. 726,392

Int. Cl.[2] **G11C** *19/00*

U.S. Cl. 365—239 **7 Claims**

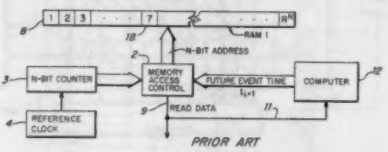
1. An event marker used in the production of an event marker output pulse during time slots within a pulse repetition interval comprising:

a. N groups of storage devices, wherein N is an integer greater than one;

b. recording means for recording a bit in a single selected storage device of each group of said N groups of storage devices;

c. first readout means for sequentially reading the storage devices of a first group of said storage devices at a first rate for detecting the presence of said bit in said first group of said storage devices;

d. second readout means for sequentially reading the storage devices of a second group of said storage devices at a second rate, less than said first rate, for detecting the presence of said bit in said second group of said storage devices;



e. N^{th} readout means for sequentially reading the storage devices of an N^{th} group of said storage devices at an N^{th} rate, less than said second rate, for detecting the presence of said bit in said N^{th} group of said storage devices; and,

f. and gate means, coupled to said first, second and N^{th} readout means for detecting the simultaneous reading of said bit in each and every group of said N groups of storage devices.

DESIGN PATENTS

GRANTED MAY 8, 1979

ERRATA

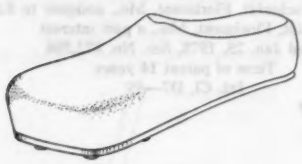
For CLASS	See PATENT NO.
D21-020	251,811
D21-036	251,812
D21-118	251,813
D21-114	251,814
D20-029	251,815

DESIGNS

MAY 8, 1979

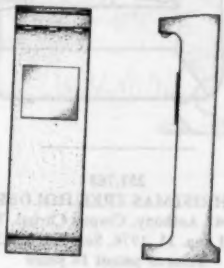
251,756
PEANUT SHOE
David N. McCrary, 1304 Leone Ave., Valdosta, Ga. 31601
Filed Dec. 20, 1976, Ser. No. 752,129
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—308

251,757
FOOTBALL KICKING SHOE
Raymond H. Pelfrey, 1595 Howard Dr., Sparks, Nev. 89431
Filed Apr. 18, 1977, Ser. No. 788,405
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—311



251,758
UTILITY BELT
Dwain Penrod, P.O. Box 1843, Elko, Nev. 89801
Filed Mar. 28, 1977, Ser. No. 781,730
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—381

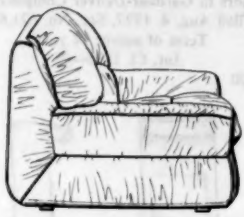
251,759
TRADE EXHIBIT STRUCTURE AND LIGHTING THEREFOR
Henry A. Pohs, Denver, and Thomas L. Davis, Aurora, both of Colo., assignors to Gardner-Denver Company, Dallas, Tex.
Filed Aug. 4, 1977, Ser. No. 821,676
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—20



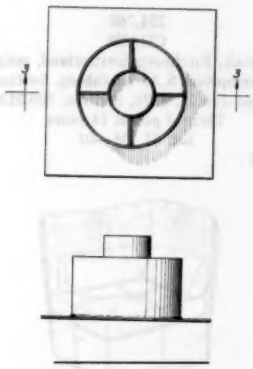
251,760
CHAIR
Andre Vandenbeuck, Kirchberg, Switzerland, assignor to Intercollection Development S.A., Kirchberg, Switzerland
Filed Jul. 27, 1976, Ser. No. 709,013
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

251,761
CHAIR
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Jan. 17, 1977, Ser. No. 764,480
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

251,762
CLUB CHAIR
Jean Prevost, 18 Bis rue Danielle Casanova, 94170 Le Perreux, France
Filed Jun. 17, 1977, Ser. No. 807,748
Claims priority, application France, Jan. 7, 1977, 77 39871
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



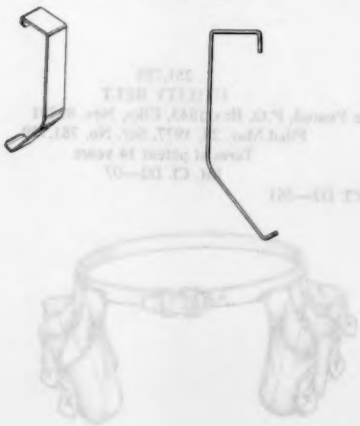
251,763
CHRISTMAS TREE HOLDER
Sam F. Sovey, 5042 Anthony, Corpus Christi, Tex. 78415
Filed Sep. 21, 1976, Ser. No. 725,322
Term of patent 14 years
Int. Cl. D6—*99*; D11—*02*
U.S. Cl. D6—105



251,764
POTTED PLANT STAND
Alwin J. Stahel, New Brighton, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 18, 1977, Ser. No. 788,660
Term of patent 14 years
Int. Cl. D6—*06, 04*
U.S. Cl. D6—183

251,765
ELECTRIC BEVERAGE MAKER
Tatsuo Okazaki, Kamifukuoka, Japan, assignor to Kabushikigaisha Omco, Oimachi, Japan
Filed Nov. 24, 1976, Ser. No. 744,685
Claims priority, application Japan, Sep. 13, 1976, 51-36198
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62

251,766
BEVERAGE CONTAINER HANDLE
Leo L. Hammerschmidt, Florissant, Mo., assignor to Edna M. Hammerschmidt, Florissant, Mo., a part interest
Filed Jan. 25, 1978, Ser. No. 872,596
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—70

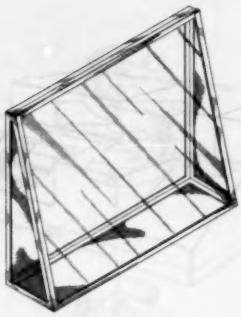


251,767

FIREPLACE SCREEN

Carrol E. Buckner, Weaverville, N.C., assignor to Buck Stove Marketing, Corporation, Asheville, N.C.

Filed Oct. 26, 1977, Ser. No. 845,707
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—208

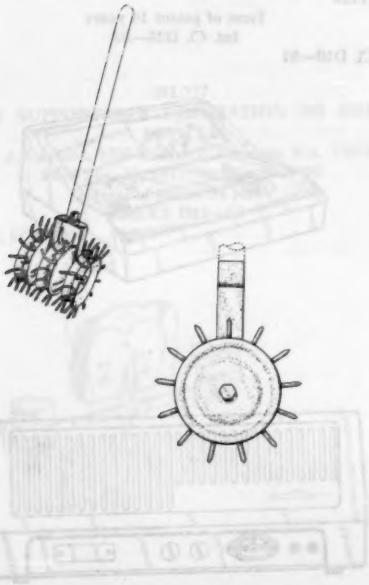


251,768

CULTIVATING IMPLEMENT

Henry P. Dellinger, 1036 Pineglen Dr., Forest Park, Ga. 30050

Filed Apr. 7, 1977, Ser. No. 785,513
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D8—7

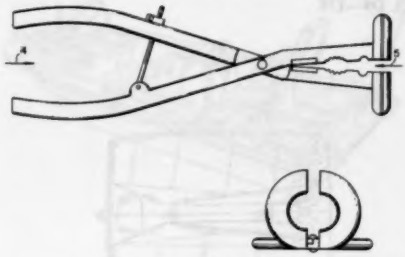


251,769

PERPENDICULAR END TUBE GRIPPING PLIERS

John J. Dobias, 1212 Sumach Dr., Windsor, Canada (N8S 2S4)

Filed Feb. 22, 1977, Ser. No. 770,930
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—58

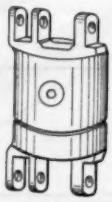


251,770

BALL BEARING SWIVEL FOR A HOOK ASSEMBLY

Lars Fredriksson, Vaxjo, Sweden, assignor to K A Bergs Smide AB

Filed Jun. 22, 1977, Ser. No. 808,824
Claims priority, application Sweden, Dec. 23, 1976, 76002554
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

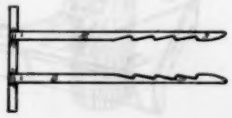


251,771

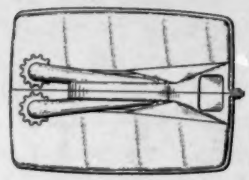
SHACKLE FOR A METER SEAL

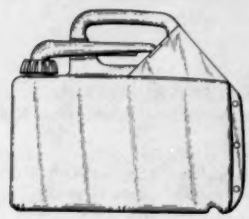
Victor R. Tritton, Montreal, Canada, assignor to Tritton Enterprises Ltd., Montreal, Canada

Filed Oct. 12, 1977, Ser. No. 841,555
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—382

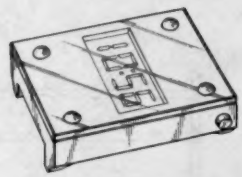


251,772
DUAL COMPARTMENT FUEL CONTAINER FOR A CHAIN SAW OR THE LIKE
Frederick T. Ernst, Thorndike Pond Rd., Jaffrey, N.H. 03452, and Frank Klay, Hingham, Mass., assignors to Frederick T. Ernst, Jaffrey, N.H.
Filed Feb. 18, 1977, Ser. No. 770,189
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—175

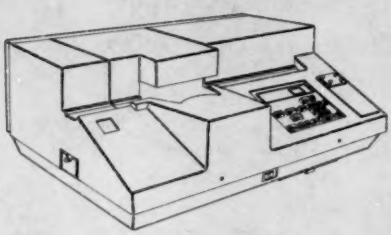




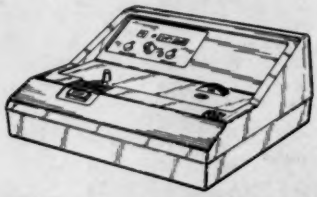
251,773
DIGITAL WATCH
Pascal Morabito, 12, Quai d'Orleans, Paris, France (75004)
Filed Jan. 25, 1977, Ser. No. 762,323
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

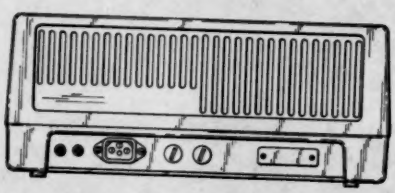


251,774
CHEMICAL ANALYZER
Richard J. Olson, Webster; Glenn E. Tersteeg, Honeoye Falls, and Michael S. Montalto, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 31, 1977, Ser. No. 802,108
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—81



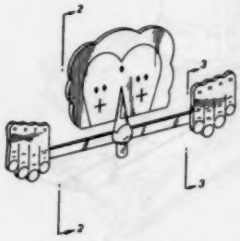
251,775
FILTER PHOTOMETER
Helmut Schmidt, Mannheim, and Heinz-Georg Fuhrer, Rauenberg, both of Fed. Rep. of Germany, assignors to Labora Mannheim GmbH fur Labortechnik, Mannheim, Fed. Rep. of Germany
Filed Mar. 17, 1978, Ser. No. 887,901
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 1129
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D10—81



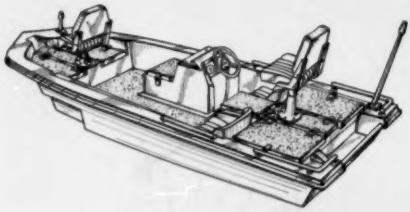


251,776
RING
Howard K. Rosen, 3320 Boxwood Dr., Montgomery, Ala. 36111
Filed Apr. 18, 1977, Ser. No. 788,428
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—30

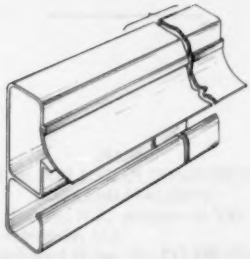
251,777
FENCE SUPPORTABLE DECORATION OR SIMILAR ARTICLE
Winton J. Canfield, 7703 Peekskill, Houston, Tex. 77075
Filed Jun. 30, 1977, Ser. No. 812,008
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160



251,778
FISHING BOAT INTERIOR
Thomas M. Trabue, Jr., White Bluff, Tenn., assignor to Ebbtide Corporation, White Bluff, Tenn.
Filed Jul. 2, 1976, Ser. No. 702,358
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—70



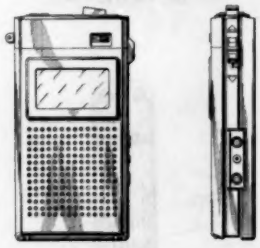
251,779
WIRING ENCLOSURE FOR DESKS
Douglas F. Wolff; Harold N. Minick, and Jay J. Reinhart, all of Marshall, Mich., assignors to Harter Corporation, Sturgis, Mich.
Filed Jun. 20, 1977, Ser. No. 808,237
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—13



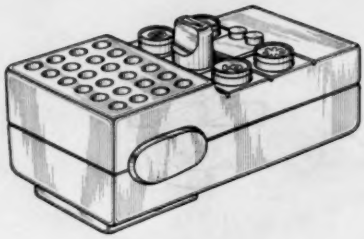
251,780
GLOW PLUG ENERGIZER
Benjamin Bowsky, Cincinnati, Ohio, assignor to Emerson Electric Co.
Filed Mar. 4, 1977, Ser. No. 774,504
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—15

251,781
ELECTRICAL WIRE CONNECTOR
James B. Hutton, Dubuque, Iowa, assignor to Blackhawk Industries, Inc., Winfield, Ala.
Filed May 4, 1977, Ser. No. 793,796
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

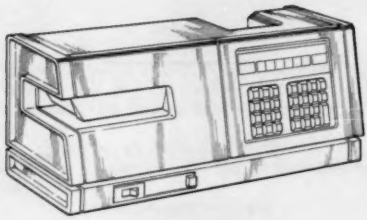
251,782
TAPE RECORDER AND PLAYER OR SIMILAR ARTICLE
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company
Filed May 16, 1977, Ser. No. 797,585
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



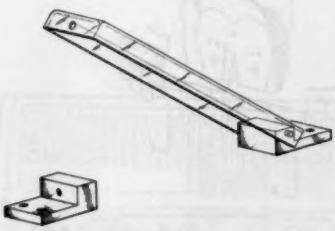
251,783
COMBINED MICROPHONE AND LOUDSPEAKER FOR A COMMUNICATION RADIO INSTALLATION
Jan E. Orn, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Apr. 22, 1977, Ser. No. 789,796
Claims priority, application Sweden,
Term of patent 3 years
Int. Cl. D14—*01*
U.S. Cl. D14—12



251,784
TRANSFER TERMINAL
Luigi DiBenedetto, El Segundo, Calif., assignor to TRW Inc., Los Angeles, Calif.
Filed Jun. 15, 1977, Ser. No. 806,629
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—45



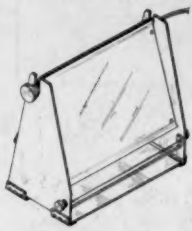
251,785
COVER FOR TELEVISION RECEIVER REAR PICTURE CONTROLS OR THE LIKE
Ronald V. Abernathy, 118 Lowell's La., Rosedale, Ind. 47874
Filed Feb. 7, 1977, Ser. No. 766,432
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—84



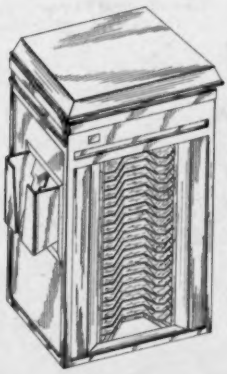
251,786
SNOW THROWER
Leo F. Wildgen, Bloomington, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Feb. 9, 1978, Ser. No. 876,490
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D15—12

251,787
LIQUID DISPENSING VACUUM CLEANER
Jelle G. Nauta, R.R. #4, Stouffville, Ontario, Canada
Filed Mar. 4, 1977, Ser. No. 774,506
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52

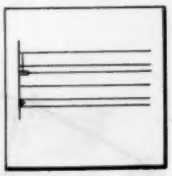
251,788
SLIDE VIEWER
Basilio Alferow, Long Island City, N.Y., assignor to Spiratone, Inc., Flushing, N.Y.
Filed Jun. 22, 1977, Ser. No. 809,136
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—14



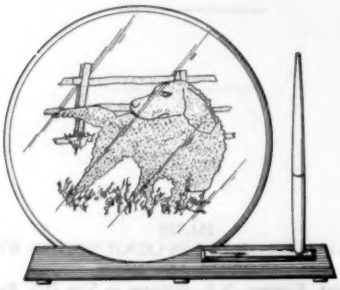
251,789
PAPER SORTER FOR USE IN CONJUNCTION WITH A COPYING MACHINE
Earl E. Hoyt, Ramsey, N.J., assignor to Van Dyk Research Corporation, Whippany, N.J.
Continuation-in-part of Ser. No. 517,958, Oct. 25, 1974, abandoned. This application May 12, 1976, Ser. No. 685,929
Term of patent 14 years
Int. Cl. D16—*03;* D14—*02*
U.S. Cl. D16—32



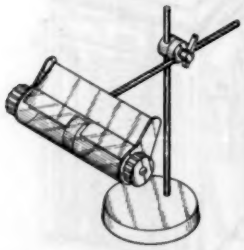
251,790
MUSIC SHEET
Wilbert G. Fritz, 305 N. Kenmore St., Arlington, Va. 22201
Continuation-in-part of Ser. No. 530,997, Dec. 9, 1974, Pat. No. Des. 245,782. This application Feb. 18, 1977, Ser. No. 770,049
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D19—1



251,791
COMBINED DESK PEN SET AND PLAQUE
William B. Campbell, Saint Paul, Minn.
Filed Apr. 18, 1977, Ser. No. 788,653
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—75

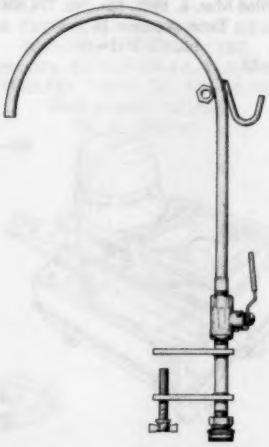


251,792
COPY HOLDER FOR A TYPIST
Clifford L. Moody, and John M. Moody, both of 6230 Gunter Way, San Jose, Calif. 95123
Filed Aug. 26, 1977, Ser. No. 828,252
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91

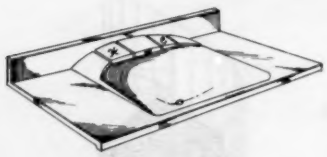


251,793
SPRAYER OR SIMILAR ARTICLE
Jacob DeGelder, Rancho Palos Verdes, Calif., assignor to The Leisure Group
Filed Feb. 9, 1977, Ser. No. 766,985
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

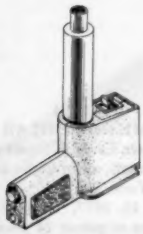
251,794
PORTABLE FAUCET
Earnest L. Smith, 2336 Robin Crest Dr., West Columbia, S.C. 29169
Filed Aug. 4, 1977, Ser. No. 821,951
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23



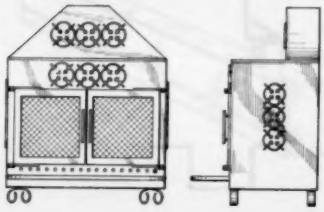
251,795
COMBINED LAVATORY AND FAUCET FIXTURE
William E. McCann, 540 S. Forest Ave., Mesa, Ariz. 85204
Filed Aug. 1, 1977, Ser. No. 820,947
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



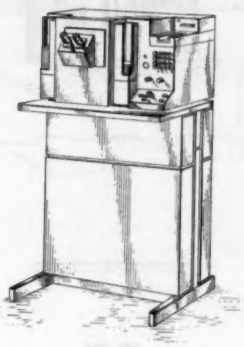
251,796
ELECTRIC HEATER
Ronald E. Edin, New Durham, N.H.; Philip G. Aberizk, Methuen, Mass.; Norman A. Mathieu, Exeter, N.H., and Ruth G. Petersen, Medfield, Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Dec. 30, 1976, Ser. No. 755,709
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—77



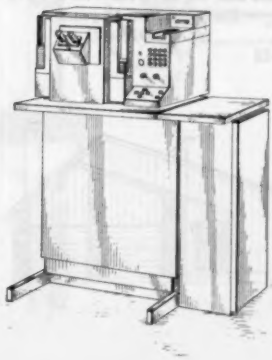
251,797
STOVE
John I. Andersen, Rte. 6, Box 66, and Eugene L. Clayton, 508 S. 3500 E., both of Idaho Falls, Id. 83401
Filed Sep. 19, 1977, Ser. No. 834,375
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



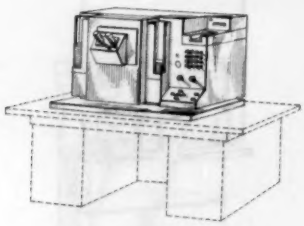
251,798
DIFFERENTIAL CELL COUNTER INSTRUMENT MODULE ASSEMBLY
Stephen G. Hauser, Tarzana, Calif., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 28, 1977, Ser. No. 772,402
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1



251,799
DIFFERENTIAL CELL COUNTER INSTRUMENT MODULE ASSEMBLY
Stephen G. Hauser, Tarzana, Calif., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 28, 1977, Ser. No. 772,403
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1

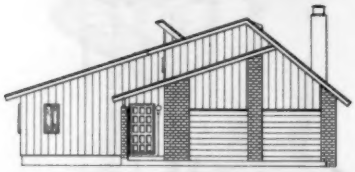


251,800
DIFFERENTIAL CELL COUNTER INSTRUMENT AND CABINET THEREFOR
Stephen G. Hauser, Tarzana, Calif., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 28, 1977, Ser. No. 772,404
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1



251,801
BUILDING STRUCTURE OR THE LIKE
Eric Gschwandtner, 1012 Deboy St., Raleigh, N.C. 27606
Filed Jun. 30, 1977, Ser. No. 811,880
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17

251,802
BUILDING STRUCTURE OR THE LIKE
Eric Gschwandtner, 1012 Deboy St., Raleigh, N.C. 27606
Filed Jun. 30, 1977, Ser. No. 811,879
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

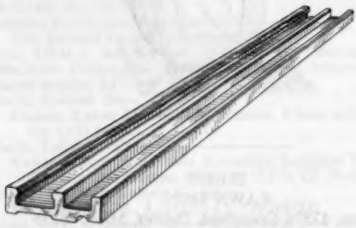


251,803
SHELTER
Richard L. Sklaar, 9767 Glenoaks Blvd., Sun Valley, Calif. 91352
Filed Jun. 13, 1977, Ser. No. 806,256
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—26

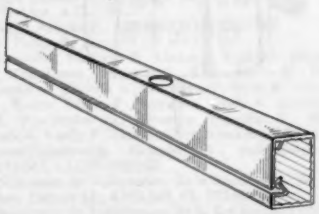
251,804
DOOR FRAME OR SIMILAR ARTICLE
Ernest Balkany, Blue Ash; Larry E. Smallwood, and Thomas M. Goens, both of Cincinnati, all of Ohio, assignors to American Standard Inc., New York, N.Y.
Filed Feb. 11, 1977, Ser. No. 767,913
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—60

251,805
SPIRAL STAIRCASE
Thomas R. Allmand, 1735 Holmes Rd., Ypsilanti, Mich. 48197
Filed May 19, 1977, Ser. No. 798,617
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—63

251,806
ROADWAY EXPANSION JOINT SEALING RETAINER EXTRUSION
John F. Brady, Wood Dale, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.
Filed Jan. 7, 1977, Ser. No. 757,561
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

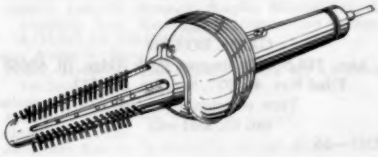


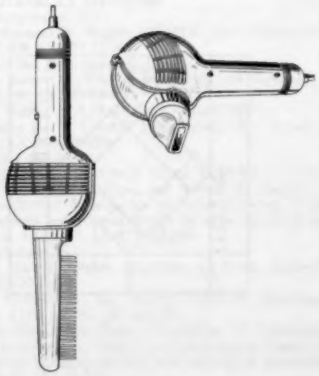
251,807
SIDE RAIL FOR A PICTURE FRAME
Erik Apri, Mariagaten 6 A, S-223 53 Lund, Sweden
Filed Jan. 30, 1978, Ser. No. 873,746
Claims priority, application Sweden, Aug. 1, 1977, 771564
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—79



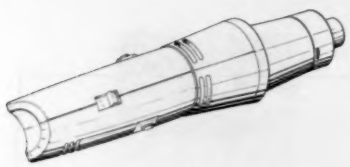
251,808
SHINGLE
Clifford J. Patenaude, Plainville, Mass., assignor to Bird & Son, Inc.
Filed Oct. 6, 1976, Ser. No. 730,064
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

251,809
HAND-HELD HAIRDRYER
Hiroshi Harigai, 2-27-3, Nishigahara, Kita-ku, Toyko, Japan
Filed Feb. 11, 1977, Ser. No. 767,670
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

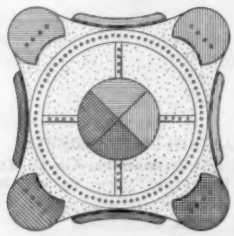




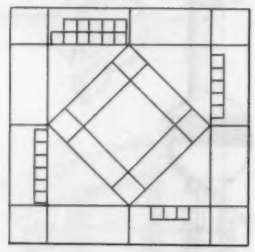
251,810
ELECTRIC HAIRDRYER
Henri Huet, Orlenas, France, assignor to Societe de Ventilation et d'Electricite Appliquees Velecta, Orleans, France
Filed Jun. 1, 1977, Ser. No. 802,319
Claims priority, application France, Dec. 17, 1976, 12
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



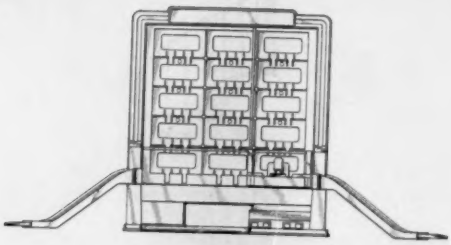
251,811
GAME BOARD
Omer Delorme, 19 Huber Blvd., Hobart, Ind. 46342
Filed Jun. 17, 1977, Ser. No. 807,350
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—20



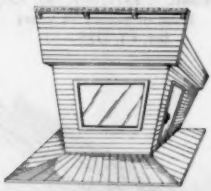
251,812
GAME BOARD
James G. Alex, 744 N. Washington, Park Ridge, Ill. 60068
Filed Nov. 4, 1977, Ser. No. 851,722
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—36



251,813
TOY PARKING GARAGE
Tetsuo Okado, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Mar. 17, 1977, Ser. No. 778,726
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—118



251,814
DOLL HOUSE
Anthony J. Christ, 3144 Broadmoor Blvd., San Bernadino, Calif. 92404
Filed Aug. 3, 1977, Ser. No. 821,430
Term of patent 14 years
Int. Cl. C21—*01*
U.S. Cl. D21—114



251,815
LAWN SIGN
Ben D. Looney, 17576 Greenfield, Detroit, Mich. 48235
Filed Aug. 4, 1977, Ser. No. 822,819
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—29

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MAY, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
Godfrey, Edmund A., 4,153,322, Cl. 339-95.00R.

A. B. Dick Company: *See*—
Halm, James M., 4,153,769, Cl. 526-195.000.
Zabiak, Daniel M.; and Hwang, Ki-Sup, 4,153,593, Cl. 260-29.6ME.

AB Celleco: *See*—
Frykhult, Rune H., 4,153,558, Cl. 210-512.00R.

AB Sibe International: *See*—
Watterback, Paul G., 4,153,846, Cl. 307-118.000.

Abe, Haruhisa; and Yonekura, Mikio, to Amada Company, Ltd. Methods and apparatus for changing dies in a press and stocking them. 4,152,978, Cl. 100-35.000.

Abe, Yuuhei: *See*—
Azuma, Nobuo; Abe, Yuuhei; Mohri, Katsuo; and Yabe, Yuhiko, 4,153,922, Cl. 361-3.000.

Aberg, Ulf: *See*—
Tomic, Relja; Aberg, Ulf; and Karlsson, Elis, 4,153,439, Cl. 65-2.000.

Abex Corporation: *See*—
Kennedy, Leroy P.; and Kalkstein, James L., 4,153,305, Cl. 303-81.000.

Abhiraman, Agaram S.: *See*—
Capps, Spencer W.; Hagler, Gerald E.; and Abhiraman, Agaram S., 4,153,409, Cl. 425-72.00S.

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Ace Controls, Inc.: *See*—
Ellis, Larry C.; and Ellis, John S., 4,153,145, Cl. 188-274.000.

Acker, Jan R.; Braton, Norman R.; Koutsky, James A.; and Wendt, Robert F. Cryogenic beach cleaner. 4,153,555, Cl. 210-198.00R.

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Ertl, Edward S., 4,152,874, Cl. 52-27.000.

Actor, Elliot J.; and Kantner, Robert F., to International Business Machines Corporation. Multiplexed control subsystem for sensor based systems. 4,153,945, Cl. 364-900.000.

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Jikihara, Kazuo; Iori, Shinichi; Kimura, Ichiro; and Adachi, Kyoichi, 4,153,444, Cl. 71-94.000.

Adachi, Tokuichi: *See*—
Kawasaki, Koichiro; Okada, Kazushige; Suginaka, Yutaka; Adachi, Tokuichi; and Shirasu, Akira, 4,152,976, Cl. 99-450.100.

Adams, John W. & Dolores C.: *See*—
Willis, William M., 4,153,003, Cl. 116-268.000.

Adams, Leon, to General Motors Corporation. Fuel dispensing nozzle. 4,153,085, Cl. 141-311.00R.

Adams, Robert P., to Virtis Company, Inc., The. Homogenizer apparatus. 4,153,374, Cl. 366-208.000.

Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., to Boots Company Limited, The. Phenylalkanoic acids. 4,153,807, Cl. 562-469.000.

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Morris, Melvyn D., 4,152,804, Cl. 15-167.00R.

Adrian, Rudolf: *See*—
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,153,803, Cl. 560-57.000.

Advance Transformer Company: *See*—
den Hollander, Jacob; and Rayno, Glenn D., 4,153,493, Cl. 156-188.000.

Aepli, Otto T.: *See*—
Garvin, Donald F.; and Aepli, Otto T., 4,153,571, Cl. 252-156.000.

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Paulsen, Donald E., 4,153,225, Cl. 244-118.00R.

Aerosol Service, A.G.: *See*—
Loeliger, Arnold E., 4,153,182, Cl. 222-95.000.

Afanasov, Fedor P.: *See*—
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

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Gouley, Gilbert M., 4,153,240, Cl. 270-68.00R.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Audibert, Francoise; Chedid, Louis; Lefrancier, Pierre; Choay, Jean; and Lederer, Edgar, 4,153,684, Cl. 424-88.000.

AGFA-Gevaert A.G.: *See*—
Blank, Rudolf; and Kluczynski, Achim, 4,153,350, Cl. 352-78.00R.
Borowski, Kurt; Stumpf, Friedrich; and Huber, Theodor, 4,153,352, Cl. 352-91.00C.
Simm, Walter, 4,153,836, Cl. 250-325.000.

Aghnides, Elie P. Aerator with metal casing having inner plastic elements moldable in one piece. 4,153,204, Cl. 239-428.500.

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Ahlstone, Arthur G., to Vetco, Inc. Misalignment connector with retained internal spherical seal. 4,153,281, Cl. 285-167.000.

Ahmed, Quazi: *See*—
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,153,803, Cl. 560-57.000.

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Hayakawa, Akifumi; Aiba, Akira; Orihara, Eiki; and Fukushima, Kiyoshi, 4,153,231, Cl. 249-82.000.

Aicher, Albrecht: *See*—
Diem, Hans; Aicher, Albrecht; Haas, Hans; Dudeck, Christian; and Finkbeiner, Fritz, 4,153,410, Cl. 431-5.000.

Aikawa, Hideyuki: *See*—
Ueno, Haruo; Oizumi, Kyohei; Ishikawa, Hideo; Nakajima, Kohei; Tsujimoto, Nobuhiro; Kimura, Osamu; and Aikawa, Hideyuki, 4,153,767, Cl. 526-141.000.

Air Preheater Company, Inc., The: *See*—
Stockman, Richard F., 4,153,102, Cl. 165-8.000.

Air Products and Chemicals, Inc.: *See*—
Longsworth, Ralph C., 4,152,903, Cl. 62-222.000.
Recktenwald, Gerald W.; and Hayes, Larry J., 4,153,659, Cl. 264-83.000.

Akademia Medyczna: *See*—
Brzozowski, Zdzislaw; Magielka, Stanislaw; Angielski, Stefan; Janicki, Stanislaw; Wojcikowski, Czeslaw; and Jakubowski, Zenon, 4,153,710, Cl. 424-273.00P.

Akaike, Junichi; and Sato, Masatoshi, to Kioritz Corporation. Cord-type cutting device of mowing apparatus. 4,152,832, Cl. 30-276.000.

Akaura, Seshiro; Nagamune, Yasushi; and Nakamura, Takeshi, to (Ashimoro Industry, Co., Ltd.) Ashimori Kogyo Kabushiki Kaisha. Cork line having foamed thermoplastic resin floats integrally bonded to a leader and a process for producing same. 4,152,798, Cl. 9-8.00R.

Akiyama, Nobuyuki: *See*—
Koizumi, Mituyoshi; Akiyama, Nobuyuki; and Kuni, Asahiro, 4,153,371, Cl. 356-400.000.

Akkumulatoren-fabrik Dr. Leopold Jungfer: *See*—
Jungfer, Leopold, deceased; Jungfer, Helmut, heir; Meyenburg, Ingeborg, heir; Kautschitsch, Dieter; and Weber, Richard, 4,153,867, Cl. 320-43.000.

Akman, Ahmet R.: *See*—
Power, James H.; and Akman, Ahmet R., 4,153,030, Cl. 123-146.50A.

Aktiebolaget Carl Munters: *See*—
Munters, Carl G., 4,152,901, Cl. 62-112.000.

Aktiebolaget IRO: *See*—
Jacobsson, Kurt A. G., 4,153,213, Cl. 242-47.010.

Aktiebolaget Tudor: *See*—
Sundberg, Erik G.; Campbell, George A.; and Doucette, Edward I., 4,153,760, Cl. 429-252.000.

Akzona Incorporated: *See*—
Capps, Spencer W.; Hagler, Gerald E.; and Abhiraman, Agaram S., 4,153,409, Cl. 425-72.00S.

Alba-Waldensian, Incorporated: *See*—
Bishop, Robert C.; Choksi, Pradip V.; and Forstrom, Richard J., 4,153,050, Cl. 128-64.000.
Boone, Walter S., 4,153,054, Cl. 128-132.00D.

Albano, Carlo J., to Cordell Engineering, Inc. Batch developing. 4,153,363, Cl. 354-299.000.

Albert, Alban: *See*—
Courbat, Pierre; and Albert, Alban, 4,153,788, Cl. 536-8.000.

Albert, Walter; Dicks, Manfred; and Schiedrum, Hans O., to Hoechst Aktiengesellschaft. Process for extrusion blowing of thermoplastic hollow articles and gripper device for drawing the parison into the blow mold. 4,153,408, Cl. 425-532.000.

Alberts, Heinrich: *See*—
Steffen, Ulrich; Alberts, Heinrich; and Prinz, Richard, 4,153,646, Cl. 260-878.00R.

Alderman, Norman H.; and Morris, Willis M. Envelope and form assembly. 4,153,163, Cl. 206-610.000.

Alexandrov, Vladimir I.; Osiko, Vyacheslav V.; Tatarinsev, Vladimir M.; and Udovenchik, Viktor T. Monocrystals based on stabilized zirconium or hafnium dioxide and method of production thereof. 4,153,469, Cl. 106-42.000.

Alexandrovich, George: *See—*
Wittenberg, Roland C.; Alexandrovich, George; and Frielingsdorf, Frank J., 4,153,257, Cl. 274-39.00R.

Allan, David T., to John MacDonald & Company (Pneumatic Tools) Ltd. Fluid operated undercutter. 4,153,121, Cl. 175-96.000.

Allen, Clifford H. Rotor drive coupling for progressing cavity pump. 4,153,397, Cl. 418-48.000.

Allen, Richard C.: *See—*
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,153,790, Cl. 544-161.000.
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,153,791, Cl. 544-161.000.

Allied Chemical Corporation: *See—*
Fitch, Robert H.; Kurtz, Bruce E.; and Rothmayer, Noel Y., 4,153,532, Cl. 204-267.000.
Garner, Eugene F., 4,152,891, Cl. 60-205.000.

Alliegro, Richard A., to Norton Company. Hot-pressing of shapes of non-uniform cross-sectional thickness. 4,153,666, Cl. 264-325.000.

Allis-Chalmers Corporation: *See—*
Parrish, Walter A., Jr., 4,153,205, Cl. 239-533.900.
Walberg, Maynard E., 4,153,138, Cl. 182-98.000.

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Alps Electric Co., Ltd.: *See—*
Murata, Taneo, 4,153,829, Cl. 200-340.000.

Alshits, Mark Z.; Kalugin, Anatoly A.; Sokolov, Gennady I.; and Kovalev, Evgeny P. Bucket-wheel trench excavator having a four-element articulated linkage including two pivotably connected hydraulic cylinders. 4,152,850, Cl. 37-97.000.

Altenweger, Alois, to Zellweger Uster Ltd. Apparatus for dividing warps with leases. 4,152,815, Cl. 28-198.000.

Amada Company, Ltd.: *See—*
Abe, Haruhisa; and Yonekura, Mikio, 4,152,978, Cl. 100-35.000.

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Amerace Corporation: *See—*
Triolo, Louis J., 4,153,589, Cl. 260-28.50B.
Vecchiotti, Camillo M.; and Goldberg, Bruce S., 4,153,665, Cl. 264-295.000.

American Cyanamid Company: *See—*
Asato, Goro, 4,153,611, Cl. 260-332.30P.
Cross, Barrington, 4,153,448, Cl. 71-120.000.
Padmanathan, Thurairajah, 4,153,632, Cl. 260-591.000.
Quinlan, James M., 4,153,678, Cl. 424-44.000.
Remley, Kenneth H., 4,153,744, Cl. 427-160.000.
Wang, Samuel S.; and Lewellyn, Morris E., 4,153,549, Cl. 210-54.000.

American Hoechst Corporation: *See—*
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,153,790, Cl. 544-161.000.
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,153,791, Cl. 544-161.000.

American Home Products Corporation: *See—*
Tsuk, Andrew G., 4,153,052, Cl. 128-90.000.

American Hospital Supply Corporation: *See—*
Choksi, Pradip V., 4,152,783, Cl. 2-168.000.

American Locker Security Systems, Inc.: *See—*
Barth, Douglas A.; and Chester, Richard J., 4,153,150, Cl. 194-92.000.

American Micro-Bionics Corp.: *See—*
von der Heide, Jack; Edelman, Robert J.; and McLeod, Murray R., 4,153,554, Cl. 210-96.00M.

Amerine, James D.: *See—*
Parish, Richard L.; and Amerine, James D., 4,153,184, Cl. 222-185.000.

AMP Incorporated: *See—*
Asick, John C., 4,153,325, Cl. 339-99.00R.
Dittmann, Larry E.; Millhimes, Wayne L.; and Steinhauer, Glenn A., 4,153,406, Cl. 425-438.000.
Frantz, Robert H.; and Zimmerman, John A., Jr., 4,153,326, Cl. 339-99.00R.

Anaconda Company, The: *See—*
Arbiter, Nathaniel; and Cooley, Benjamin D., 4,153,522, Cl. 204-106.000.

ANARAD, Inc.: *See—*
Ross, Thaddeus C., 4,153,837, Cl. 250-343.000.

Anash, Shulim A.: *See—*
Litvak, Rafael S.; Rannev, Georgy G.; Anash, Shulim A.; Kim, Larisa P.; Pen-Chen-Sek, Alexandr I.; Borkov, Gennady E.; Nikiforov, Anatoly E.; Shutchenko, Vladimir G.; and Tabachnikov, Mikhail M., 4,153,521, Cl. 204-105.00R.

Anderson, David; Brown, Kenneth R.; and Linklater, William L., to Ferranti Limited. Inertial platforms. 4,152,942, Cl. 74-5.00R.

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Anderson, Richard J.: *See—*
Cohen, Richard L.; and Anderson, Richard J., 4,153,865, Cl. 318-565.000.

Anderson, Stanley E., to General Motors Corporation. Steering travel limiter for power steering gear. 4,153,133, Cl. 180-154.000.

Ando, Masahisa: *See—*
Yamazaki, Masami; and Ando, Masahisa, 4,153,078, Cl. 137-882.000.

Andregg, James, to Clear-Vu, Inc. Heating unit for windshield wiper. 4,152,808, Cl. 15-250.070.

Andros Incorporated: *See—*
Clark, Kenneth D.; Jassawalla, Jal S.; and Portner, Peer M., 4,152,786, Cl. 3-1.700.

Angeles, Marshall R.: *See—*
Gradeff, Peter S.; and Angeles, Marshall R., 4,153,633, Cl. 260-593.00R.

Angielski, Stefan: *See—*
Brzozowski, Zdzislaw; Magielka, Stanislaw; Angielski, Stefan; Janicki, Stanislaw; Wojcikowski, Czeslaw; and Jakubowski, Zenon, 4,153,710, Cl. 424-273.00P.

Annis, James R., to Signode Corporation. Slip-feed strapping machine. 4,153,499, Cl. 156-494.000.

Anthony, Robert E.: *See—*
Mort, Charles B.; and Anthony, Robert E., 4,152,818, Cl. 29-157.30C.

Anthony, Zacharias. Gravity-type racing game. 4,153,250, Cl. 273-86.00C.

Antonetti, Vincent W.; and Gupta, Omkarath R., to International Business Machines Corporation. Temperature equalizing element for a conduction cooling module. 4,153,107, Cl. 165-185.000.

Antonov, Asparuch M.: *See—*
Balevski, Angel T.; Nikolov, Ivan D.; and Antonov, Asparuch M., 4,153,100, Cl. 164-155.000.

Aoyama, Syunichi, to Nissan Motor Company, Limited. Secondary air supply device for engine exhaust system. 4,152,892, Cl. 60-290.000.

Approach Fish: *See—*
Woodhouse, Charles F., 4,152,933, Cl. 73-189.000.

Aquarian, Star T. Apparatus for weaning children. 4,153,170, Cl. 215-11.00R.

Aquila S.p.A.: *See—*
Bussi, Giancarlo; and Baradel, Pierpaolo, 4,152,915, Cl. 72-42.000.

Aragon, Gregorio: *See—*
Saldarriaga, Nydia; and Aragon, Gregorio, 4,152,805, Cl. 15-168.000.

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Arco Polymers, Inc.: *See—*
Kersting, R. James; and Harris, James J., 4,153,171, Cl. 215-12.00R.

Arest-Yakubovich, Alexandr A.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Arledge, Arthur L.: *See—*
Grier, William R.; Shepard, Francis H., Jr.; and Arledge, Arthur L., 4,153,940, Cl. 340-711.000.

Arlt, Dieter: *See—*
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Arlt, Dieter; and Schroer, Hans, 4,153,596, Cl. 260-45.80N.

Armaturenfabrik Wallisellen AG: *See—*
Egli, Werner, 4,153,077, Cl. 137-625.170.

Armco Steel Corporation: *See—*
Thornton, John A.; and Compton, Thomas A., 4,153,006, Cl. 118-63.000.

Armitage, Bernard J.: *See—*
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 4,153,807, Cl. 562-469.000.

Armstrong, Anthony C., to Hy-Mac Limited. Apparatus for breaking up a layer of substantially rigid material. 4,153,301, Cl. 299-36.000.

Armstrong Cork Company: *See—*
Booth, Alfred E.; and Schutter, Daniel W., 4,153,503, Cl. 162-123.000.

Arndt, Friedrich: *See—*
Boroschewski, Gerhard; and Arndt, Friedrich, 4,153,447, Cl. 71-111.000.

Arnold, Karl-Heinz: *See—*
Neumann, Rainer; Schwarz, Hans-Helmut; and Arnold, Karl-Heinz, 4,153,810, Cl. 568-630.000.

Arthur G. McKee & Company: *See—*
Wintrell, Reginald, 4,153,426, Cl. 48-73.000.

Arumugham, Rangaswamy; and Kam, George H., to GTE Sylvania Incorporated. Network for applying a plurality of control voltages to a common control terminal. 4,153,914, Cl. 358-195.000.

Arundale, Inc.: *See—*
Tanner, Robert G., 4,153,303, Cl. 301-63.0PW.

Asahi Glass Co. Ltd.: *See—*
Yamabe, Masaaki; Munekata, Seiji; and Samejima, Shunichi, 4,153,804, Cl. 560-183.000.

Asai, Osamu: *See—*
Suzuki, Yoshihiro; Minakawa, Tadashi; and Asai, Osamu, 4,153,519, Cl. 204-40.000.

Asano, Masaharu; and Ezoe, Mitsuhiko, to Nissan Motor Company, Limited. Electronic closed loop air-fuel ratio control system. 4,153,022, Cl. 123-119.0EC.

Asano, Masaharu; and Hosaka, Akio, to Nissan Motor Company, Limited. Exhaust gas sensor temperature detection system. 4,153,023, Cl. 123-119.0EC.

Asato, Goro, to American Cyanamid Company. Substituted tetrahydrobenzothiophenes and method of preparation thereof. 4,153,611, Cl. 260-332.30P.

(Ashimoro Industry, Co., Ltd.) Ashimori Kogyo Kabushiki Kaisha: *See*—
Akaura, Seshiro; Nagamune, Yasushi; and Nakamura, Takeshi, 4,152,798, Cl. 9-8.00R.

Asick, John C., to AMP Incorporated. Method and connector for terminating twisted pair and ribbon cable. 4,153,325, Cl. 339-99.00R.

Asmus, Kurt: *See*—
Gregor, Karl; and Asmus, Kurt, 4,153,515, Cl. 202-241.000.

Atkinson, Joseph G.; Rooney, Clarence S.; Girard, Yves; and Engelhardt, to Merck & Co., Inc. Indolyl amino acids useful as antihypertensive agents. 4,153,715, Cl. 424-274.000.

Atlantic Products Corporation: *See*—
Patton, James S.; and Housel, Richard W., 4,153,146, Cl. 190-44.000.

Atlantic Richfield Company: *See*—
Blieden, Harry R.; and Sill, Richard C., 4,153,813, Cl. 136-89.0PC.

Atlas Copco Aktiebolag: *See*—
Lindh, K. Gosta, 4,152,925, Cl. 73-40.50R.

Audibert, Francoise; Chedid, Louis; Lefrancier, Pierre; Choay, Jean; and Lederer, Edgar, to Agence Nationale de Valorisation de la Recherche (ANVAR). Immunizing and anti-infectious adjuvant agents constituted by N-acetyl-muramyl-L-alanyl-D-glutamic acid derivatives. 4,153,684, Cl. 424-88.000.

Avershin, Vasily T.: *See*—
Rumyantsev, Leonid A.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,152,894, Cl. 60-347.000.

Avnet, Inc.: *See*—
Guha, Dwipendra N., 4,153,256, Cl. 274-23.00A.

Avon Products, Inc.: *See*—
Descovich, Theodore; Donadio, Louis F.; and Cecere, Anthony F., 4,153,662, Cl. 264-227.000.

Awerbuch, Leon, to Bechtel International Corporation. Energy transfer apparatus and method using geothermal brine. 4,152,898, Cl. 60-641.000.

Axelrod, Donald J., to Bell & Howell Company. Web cassette with cartridge load. 4,153,361, Cl. 354-275.000.

Ayano, Yukihiko; Yashiro, Kuniji; and Niizuma, Akira, to Oxy Metal Industries Corporation. Acidic zinc phosphate solution and method. 4,153,479, Cl. 148-6.15Z.

Aziende Colori Nazionali Affini -ACNA S.p.A.: *See*—
Rosati, Enzo, 4,153,599, Cl. 260-207.000.

Azuma, Nobuo; Abe, Yuuhei; Mohri, Katsuo; and Yabe, Yuhiko, to Hitachi, Ltd. Relay control circuit. 4,153,922, Cl. 361-3.000.

B. F. Goodrich Company, The: *See*—
Kroenke, William J., 4,153,792, Cl. 544-181.000.

Baba, Toshihiko; Uomori, Akiyoshi; and Tsuchitani, Tadayasu, to Mitsubishi Denki Kabushiki Kaisha. Welding apparatus. 4,153,830, Cl. 219-101.000.

Babcock and Wilcox of Africa: *See*—
Fraser, Donald S., 4,153,209, Cl. 241-103.000.

Bachand, Carol: *See*—
Monkovic, Ivo; Bachand, Carol; and Wong, Henry, 4,153,603, Cl. 546-142.000.

Bacher, Helmut. Microwave equalizer with coaxial cable resonant stubs. 4,153,885, Cl. 333-28.00R.

Bachli, Emil. Vacuum tank. 4,153,103, Cl. 165-47.000.

Bader, Henry; and Whitten, Charles E., to Polaroid Corporation. Process for processing silver halide developing agents. 4,153,631, Cl. 260-590.00C.

Bader, Jorg, deceased (by Bader-Ludwig, Dagmar, legal representative), to Ciba-Geigy Corporation. N-Phosphinylamidines. 4,153,604, Cl. 546-22.000.

Bader-Ludwig, Dagmar, legal representative: *See*—
Bader, Jorg, deceased, 4,153,604, Cl. 546-22.000.

Baer, Ralph H., to Marvin Glass & Associates. Optical scanner masking means. 4,153,821, Cl. 179-100.40D.

Bailey, Terry R., to Minnesota Mining and Manufacturing Company. Process for printing reflective sheet material. 4,153,412, Cl. 8-2.50A.

Baker International Corporation: *See*—
Szescila, Andrew J., 4,153,109, Cl. 166-250.000.

Bald, Wilfried; and Polking, Hans, to Schloemann-Siemag Aktiengesellschaft. Coil conveyor apparatus. 4,152,919, Cl. 72-250.000.

Balevski, Angel T.; Nikolov, Ivan D.; and Antonov, Asparuch M., to Institut Po Metaloznanie I Technologia Na Metalite. Low-pressure or counterpressure casting apparatus. 4,153,100, Cl. 164-155.000.

Balinski, Henry A., to United States Gypsum Company. Stud for forming fire-rated wall and structure formed therewith. 4,152,878, Cl. 52-481.000.

Balko, Terry W.; and Hackler, Ronald E., to Eli Lilly and Company. 2-Substituted-N-(3-substituted phenyl)-oxazolidine-3-carbothioamides. 4,153,701, Cl. 424-263.000.

Bankston, Charles E.: *See*—
Cheape, Dudley W., Jr.; and Bankston, Charles E., 4,153,787, Cl. 528-500.000.

Banszki, Miklos: *See*—
Domok, Istvan; Kocsis, Oliver; Banszki, Miklos; and Horvath, Jeno, 4,152,829, Cl. 30-139.000.

Baradel, Pierpaolo: *See*—
Bussi, Giancarlo; and Baradel, Pierpaolo, 4,152,915, Cl. 72-42.000.

Barenyi, Bela; Haselmann, Heinrich; and Rieth, Egon, to Daimler-Benz Aktiengesellschaft. Lateral covering for a passenger motor vehicle. 4,153,290, Cl. 296-191.000.

Barkan, Philip, to General Electric Company. Stored-energy operating means for an electric circuit breaker. 4,153,828, Cl. 200-153.0SC.

Barmag Barmer Maschinenfabrik AG: *See*—
Lenk, Erich; Mayer, Manfred; and Munnekehoff, Gerd, 4,153,211, Cl. 242-35.50A.

Barner, Richard; and Schmid, Max, to Hoffmann-La Roche Inc. Synthesis of (S)-(+)-6-hydroxy-2,5,7,8-tetramethylchroman-2-methanol and intermediates therein. 4,153,614, Cl. 260-340.90R.

Barnert, Eike, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Gas-feed nozzle for a pyrolytic particle coating apparatus. 4,153,004, Cl. 118-48.000.

Baron, George B., to Dresser Industries, Inc. Crowd system for power shovels. 4,153,166, Cl. 414-695.000.

Barone, Bruno J., to Denka Chemical Corporation. Oxidation catalysts and process for preparing anhydride from alkanes. 4,153,577, Cl. 252-435.000.

Barozzi, Dan A.; Calin, Valentin; and Peter, Zsigmond, to Intreprinderea de Radiatoare Si Cabluri Brasov. Process for the attenuation of electro-corrosion in cooler assemblies soldered by thermal bath immersion. 4,153,195, Cl. 228-183.000.

Barron, Ellis. Pneumatic piano action. 4,152,967, Cl. 84-236.000.

Barry, James J.: *See*—
Clements, Porter; Basila, Michael R.; and Barry, James J., 4,153,671, Cl. 423-244.000.

Barth, Douglas A.; and Chester, Richard J., to American Locker Security Systems, Inc. Coin operated lock. 4,153,150, Cl. 194-92.000.

Barth, Klaus: *See*—
Fischer, Karl; and Barth, Klaus, 4,153,833, Cl. 219-449.000.

Barton, Brandon H.; and Sagel, John A. Neutralization process. 4,153,625, Cl. 260-457.000.

BASF Aktiengesellschaft: *See*—
Boehn, Hugo; Treptow, Wolfram; Wunsch, Gerd; Kiener, Volker; Meyer, Hermann; and Csizi, Gotthard, 4,153,742, Cl. 427-126.000.
Boettcher, Klaus; Hoerdt, Heinrich G.; Zacher, Wieland; and Buechner, Oskar, 4,153,774, Cl. 526-352.200.
Diem, Hans; Aicher, Albrecht; Haas, Hans; Dudeck, Christian; and Finkbeiner, Fritz, 4,153,410, Cl. 431-5.000.
Eilingsfeld, Heinz; and Seybold, Guenther, 4,153,607, Cl. 260-306.80F.
Fink, Peter; Wild, Hans; Zizlsperger, Johann; Reffert, Rudi W.; and Thielen, Gunter, 4,153,501, Cl. 159-49.000.
Graefje, Heinz; Nottes, Guenther; Mueller, Herbert; Daumiller, Guenther; and Hoffmann, Herwig, 4,153,425, Cl. 44-71.000.
Horn, Peter; Leppmeier, Franz; Eckert, Guenter; and Fischer, Karl, 4,153,784, Cl. 528-338.000.
Kappel, Ernst, 4,153,445, Cl. 71-94.000.

BASF Wyandotte Corporation: *See*—
Garvin, Donald F.; and Aepli, Otto T., 4,153,571, Cl. 252-156.000.

Basila, Michael R.: *See*—
Clements, Porter; Basila, Michael R.; and Barry, James J., 4,153,671, Cl. 423-244.000.

Basova, Raisa V.: *See*—
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Bass, Melvin L.; and Buford, Wesley E. Motor vehicle safety wheel. 4,153,302, Cl. 301-39.00T.

Bata Shoe Company, Inc.: *See*—
Sanderson, Clifford, 4,153,402, Cl. 425-145.000.

Batchelor, Dewitt L. Remote control device for model airplane. 4,153,243, Cl. 272-31.00A.

Batchelor, Philip J.; and Legg, Ernest L., to Xerox Corporation. Double document feed detection for a document handler in a reproduction machine. 4,153,241, Cl. 271-4.000.

Batson, William A., to Singer Company, The. Radial saw. 4,152,961, Cl. 83-471.300.

Bauch, Ernst; Kayser, Hans D.; and Peters, Herbert, to Neumunstersche Maschinen- und Apparatebau Gesellschaft mbH. Apparatus for accumulating ropes in storage cans. 4,153,212, Cl. 242-47.000.

Bausch & Lomb Incorporated: *See*—
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., 4,153,641, Cl. 260-827.000.

Baxter, Hallie W.: *See*—
Wilson, Thomas A.; and Baxter, Hallie W., 4,153,268, Cl. 280-296.000.

Baxter Travenol Laboratories, Inc.: *See*—
Ward, Gary A.; and Winchell, David A., 4,153,173, Cl. 215-232.000.

Bayer Aktiengesellschaft: *See*—
Gerken, Rudolf; Guth, Hans; Mucke, Christoph; Potes, Willi; and Wieschen, Hermann, 4,153,628, Cl. 423-531.000.
Hohmann, Walter; and Schutze, Detlef-Ingo, 4,153,608, Cl. 260-316.000.
Horlein, Ulrich; Boshagen, Horst; and Seuter, Friedel, 4,153,702, Cl. 424-267.000.
Hund, Franz; and Kresse, Peter, 4,153,465, Cl. 106-14.250.
Kramer, Wolfgang; Buchel, Karl H.; and Plempel, Manfred, 4,153,692, Cl. 424-245.000.
Kramer, Wolfgang; Buchel, Karl H.; and Plempel, Manfred, 4,153,708, Cl. 424-273.00R.

Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Arlt, Dieter; and Schroer, Hans, 4,153,596, Cl. 260-45.80N.
Schnabel, Eugen; Reinhardt, Gerd; Schlumberger, Horst D.; Truscheit, Ernst; and Tschesche, Harold, 4,153,687, Cl. 424-177.000.
Steffen, Ulrich; Alberts, Heinrich; and Prinz, Richard, 4,153,646, Cl. 260-878.00R.
Winkelmann, Hans D.; Wolf, Karlheinz; Oertel, Harald; and Weimann, Norbert, 4,153,775, Cl. 528-45.000.

Bearcroft, Robert G.: *See*—
Chaplin, George B. B.; Smith, Roderick A.; and Bearcroft, Robert G., 4,153,815, Cl. 179-1.00P.

Beard, Charles D.: *See*—
Dunks, Gary B.; and Beard, Charles D., 4,153,672, Cl. 423-287.000.

Bechtel International Corporation: *See*—
Awerbuch, Leon, 4,152,898, Cl. 60-641.000.
Leonard, Byron H., Jr., 4,153,194, Cl. 228-29.000.

Beck, James R.; and Gajewski, Robert P., to Eli Lilly and Company. Fungicidal and herbicidal methods. 4,153,730, Cl. 424-330.000.

Becker, Colman L., to Pullman Incorporated. Low energy ammonia synthesis process. 4,153,673, Cl. 423-359.000.

Becker, Karl-Heinz; Gunther, Friedhelm; Gerber, Manfred; and Roll, Werner, to Hoesch Werke Aktiengesellschaft. Apparatus for chip removal and chip receiving when seaming metal bands. 4,153,216, Cl. 242-56.200.

Becton, Dickinson and Company: *See*—
Kessler, Stephen B., 4,153,739, Cl. 427-2.000.

Beecham Group Limited: *See*—
Davis, Adrian F.; and Dixon, Gordon I. A., 4,153,691, Cl. 424-230.000.
Gardner, Derek V., 4,153,617, Cl. 260-345.200.
Goudie, Alexander C., 4,153,718, Cl. 424-275.000.
Ponsford, Roger J., 4,153,714, Cl. 424-274.000.

Been, Lars J., Jr. Apparatus for and method of dissolving a solid in a liquid. 4,153,377, Cl. 366-317.000.

Behnke, Robert C., to Stanadyne, Inc. Alloyed chilled iron. 4,153,017, Cl. 123-90.510.

Beiter, Charles B.; and Hafner, Leroy A., to M&T Chemicals Inc. Stable dispersions containing triorganotin fluorides. 4,153,574, Cl. 252-316.000.

Bell & Howell Company: *See*—
Axelrod, Donald J., 4,153,361, Cl. 354-275.000.

Bell Telephone Laboratories, Incorporated: *See*—
Gillette, Dean, 4,153,329, Cl. 350-96.130.
Grandle, James A., Jr., 4,153,944, Cl. 364-900.000.
Koontz, Donald E.; and Turner, Dennis R., 4,153,523, Cl. 204-129.600.
Lau, Chun-Lim; and Smith, Richard G., 4,153,835, Cl. 250-214.00C.
Miedema, Hotze, 4,153,886, Cl. 333-156.000.
Pease, Roger F. W., 4,153,843, Cl. 250-492.00A.
Tomlinson, Walter J., III, 4,153,330, Cl. 350-96.170.

Bellanca, Gary J., to Wright Line Inc. Record keeping system. 4,153,277, Cl. 282-9.00R.

Belles, Wayne S.: *See*—
Shen, Kelvin K.; and Belles, Wayne S., 4,153,443, Cl. 71-88.000.

Beloit Corporation: *See*—
Justus, Edgar J., 4,153,504, Cl. 162-133.000.

Belt, Jerry L.: *See*—
United States of America, National Aeronautics and Space Administration; Goodloe, Radford R.; Toole, Pierce C.; Belt, Jerry L.; and Leininger, Donald B., 4,153,818, Cl. 179-27.0CA.

Beltone Electronics Corporation: *See*—
Cerny, Elmer J., 4,153,758, Cl. 429-98.000.

Belyo, Steven C.: *See*—
King, William H.; Kraus, Bernhard J.; and Belyo, Steven C., 4,153,020, Cl. 123-117.00R.

Beman, Donald K.; Faccioli, Edward A.; and Rimberg, David B., to Certain-teed Corporation. Apparatus and method for collection of contaminants. 4,153,432, Cl. 55-90.000.

Benavides, Armando: *See*—
Hall, Stanley R.; and Benavides, Armando, 4,153,849, Cl. 307-295.000.

Bender, Hans; Zabel, Wolf; Duren, Gottfried; and Unkelbach, Karl-Heinz, to Klockner-Humboldt-Deutz AG. High intensity magnetic separator for the wet preparation of magnetizable particles of solids. 4,153,542, Cl. 209-223.00R.

Bender, Paul E.; and Hill, David T., to SmithKline Corporation. 6-Hydroxy-5,6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazoles. 4,153,706, Cl. 424-270.000.

Bendix Corporation, The: *See*—
Cohen, Richard L.; and Anderson, Richard J., 4,153,865, Cl. 318-565.000.
Fulmer, Keith H., 4,152,952, Cl. 74-517.000.
Sweet, Charles R., 4,153,014, Cl. 123-32.0EA.

Benno, Edward L., to Illinois Tool Works Inc. Fluid collector and multipackage system. 4,153,155, Cl. 206-150.000.

Bequette, Noah L. Folding scaffold support. 4,153,229, Cl. 248-240.300.

Bercik, Paul G.; Swift, Harold E.; and Metzger, Kirk J., to Gulf Research & Development Company. Olefin polymerization process. 4,153,638, Cl. 585-526.000.

Bereyziat, Daniel, to Etablissements DEBOR. Hoisting and handling device having weighing means. 4,153,123, Cl. 177-147.000.

Berg, Christoph: *See*—
Knothe, Erich; Berg, Christoph; and Melcher, Franz J., 4,153,124, Cl. 177-210.0EM.
Knothe, Erich; Berg, Christoph; Stadler, Eberhard; and Kohne, Hans-Heinrich, 4,153,126, Cl. 177-229.000.

Berg, Jeffrey H.; and Haas, Gerhard J., to General Foods Corporation. Concentrated liquid low calorie sweetner. 4,153,737, Cl. 426-548.000.

Berger, Harvey L.; and Brandow, Charles R., to Sono-Tek Corporation. Transducer assembly, ultrasonic atomizer and fuel burner. 4,153,201, Cl. 239-102.000.

Berghauser, Gunter; and Uhlig, Fritz, to Hoechst Aktiengesellschaft. Layer support for light-sensitive material adapted to be converted into a planographic printing plate. 4,153,461, Cl. 96-75.000.

Bergman, Ernest R.: *See*—
Elson, John P.; and Bergman, Ernest R., 4,153,392, Cl. 417-372.000.

Bergmann, Rolf: *See*—
Gericke, Rolf; Rogalski, Werner; Bergmann, Rolf; Hameister, Walter; and Wahlig, Helmut, 4,153,693, Cl. 424-246.000.

Bernheim, Willy: *See*—
Deiner, Hans; Sandner, Bernhard; and Bernheim, Willy, 4,153,640, Cl. 260-827.000.

Berry, Bernie B., Jr.; and Melvin, Myron F., to Inland Industries Inc. Foldable safety sign. 4,152,854, Cl. 40-610.000.

Bertling, Johannes-Gerhard, to Robert Bosch GmbH. Device for influencing the composition of the operating mixture supplied to an internal combustion engine. 4,153,024, Cl. 123-124.00R.

Bertoldi, Attilio. Device for the continuous setting of woollen or union fabrics. 4,152,908, Cl. 68-9.000.

Beyer, Horst; Neuhauser, Hans J.; and Veutgen, Hans-Jurgen, to Goetzewerke Friedrich Goetze AG. Friction stressed machine parts of cast iron with ledeburitic bearing surface and methods for their production. 4,153,477, Cl. 148-1.000.

Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., to Canada Packers Limited. Acetals and ketals of ascorbic acid and anti-nitrosamine compositions and methods using same. 4,153,613, Cl. 260-340.90R.

Bialobrzeski, Walter. Container safety closure. 4,153,172, Cl. 215-209.000.

Bianchi, Valerio; and Latsch, Reinhard, to Robert Bosch GmbH. Method and apparatus for controlling the operation of an internal combustion engine. 4,153,013, Cl. 123-32.0EA.

Biax-Fiberfilm Corporation: *See*—
Schwarz, Eckhard C. A., 4,153,751, Cl. 428-304.000.

Bichot, Bernard H.; and Gest, Rene, to Saint-Gobain Industries. Method and apparatus for manufacture of insulating sleeves. 4,153,498, Cl. 156-446.000.

Biedebach, Lawrence W. Trailer steering and towing hitch. 4,153,132, Cl. 180-136.000.

Bienvenu, Joseph O., to Petrolite Corporation. Isocyanated polyvalent metal salts of natural waxes. 4,153,468, Cl. 106-31.000.

Bieth, Joseph G.: *See*—
Dimicoli, Jean-Luc; Wermuth, Camille G.; and Bieth, Joseph G., 4,153,688, Cl. 424-177.000.

Billmeyer, Thomas F.; and Faehling, Francis L., to Preway Inc. Fireplace construction. 4,153,036, Cl. 126-121.000.

Biotest-Serum-Institut GmbH: *See*—
Stephan, Wolfgang, 4,153,683, Cl. 424-85.000.

Birfield Trasmissioni S.p.A.: *See*—
Stiasny, Carl-Heinz, 4,153,035, Cl. 126-91.00A.

Birkner, John M.: *See*—
Ghest, Robert C.; Chua, Hua-Thye; and Birkner, John M., 4,153,938, Cl. 364-760.000.

Birtcher Corporation, The: *See*—
Prater, Earle F., 4,153,314, Cl. 312-320.000.

Bischoff, Dieter, to Carl Freudenberg, Firma. Weather-resistant vulcanizable covering. 4,153,748, Cl. 428-57.000.

Bishop, Clifford F.; and Schultz, John T., to Square D Company. Bus stab for panelboard assembly. 4,153,318, Cl. 339-22.00B.

Bishop, Robert C.; Choksi, Pradip V.; and Forstrom, Richard J., to Alba-Waldensian, Incorporated. Pulsatile stocking and bladder therefor. 4,153,050, Cl. 128-64.000.

Bishop, Thomas D., to Deritend Engineering Company Limited, The. Feeders for web material. 4,153,191, Cl. 226-143.000.

Bissett, Larry A.; Friggens, Gary R.; and McGee, James P., to United States of America, Energy. Apparatus and method for feeding coal into a coal gasifier. 4,153,427, Cl. 48-86.00R.

Black, Brent C.; and Hill, P. Larry, to Envirotech Corporation. Liquid apportioning device. 4,153,071, Cl. 137-386.000.

Blackmond, George O. Appliance control timer drive means. 4,153,824, Cl. 200-35.00R.

Blackwelders: *See*—
Schmidt, Lewis W., 4,152,979, Cl. 100-53.000.

Blank, Rudolf; and Kluczynski, Achim, to AGFA-Gevaert A.G. Rechargeable magazine for motion picture film. 4,153,350, Cl. 352-78.00R.

Blendax-Werke R. Schneider GmbH & Co.: *See*—
Raaf, Helmut; and Heumann, Oskar, 4,152,806, Cl. 15-169.000.

Blieden, Harry R.; and Sill, Richard C., to Atlantic Richfield Company. Luminescent solar collector. 4,153,813, Cl. 136-89.0PC.

Blohm, Thomas R.: *See*—
Grisar, Johann M.; Blohm, Thomas R.; and Roberts, Edward M., 4,153,235, Cl. 260-239.00B.

Bloom, Allen; and Hung, Ling K., to RCA Corporation. Liquid crystal dyestuffs and electro-optic devices incorporating same. 4,153,343, Cl. 350-349.000.

Blount, David H. Process for the production of polyisocyanate organic silicate solid/cellular solid product. 4,153,764, Cl. 521-155.000.

Blount, David H. Organic hydroxy silicates utilized as curing agents for polyurethane prepolymers. 4,153,768, Cl. 521-155.000.

Blue, William C. Mounting assembly for a brakeline tee. 4,153,279, Cl. 285-62.000.

Blume, Henry M., Jr.; Stamm, David A.; and Budde, David L., to Intel Corporation. Single chip MOS computer with expandable memory. 4,153,933, Cl. 364-200.000.

Bodes, Ulrich: *See*—
Christgau, Hermann; and Bodes, Ulrich, 4,153,854, Cl. 313-101.000.

Boehn, Hugo; Treptow, Wolfram; Wunsch, Gerd; Kiener, Volker; Meyer, Hermann; and Csizi, Gotthard, to BASF Aktiengesellschaft. Manufacture of electrodes. 4,153,742, Cl. 427-126.000.

Boehringer Mannheim GmbH: *See*—
Edelmann, Hermann; Kraft, Peter; Mann, Karlheinz; Schuler, Peter; and Hagen, Alexander, 4,153,513, Cl. 195-103.50R.
Wolff, Hans P.; Witte, Ernst-Christian; Thiel, Max; Stork, Harald; and Roesch, Egon, 4,153,728, Cl. 424-319.000.

Boeing Company, The: *See*—
Paulsen, Donald E., 4,153,225, Cl. 244-118.00R.

Boettcher, Klaus; Hoerdt, Heinrich G.; Zacher, Wieland; and Buechner, Oskar, to BASF Aktiengesellschaft. Manufacture of high pressure polyethylene. 4,153,774, Cl. 526-352.200.

Bogert, Clayton. Fluid jet cutting of rolls of material. 4,152,958, Cl. 82-47.000.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,152,993, Cl. 111-8.000.

Bonner, Alex G.; and Horn, Marcus J. Process and apparatus for pulse labelling protein material in the Edman degradation process. 4,153,416, Cl. 23-230.00A.

Bonnie, G. Patrick, to Control Data Corporation. Conductor driven field access magnetic bubble memory propagation system. 4,153,947, Cl. 365-6.000.

Boone, Walter S., to Alba-Waldensian, Incorporated. Tubular surgical drape. 4,153,054, Cl. 128-132.00D.

Booth, Alfred E.; and Schutter, Daniel W., to Armstrong Cork Company. Method of wet-forming mineral fiberboard product having damage-resistant overlay. 4,153,503, Cl. 162-123.000.

Boots Company Limited, The: *See*—
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 4,153,807, Cl. 562-469.000.

Bopp, Ernst: *See*—
Scherrer, Herbert; Bopp, Ernst; and Cecchetto, Ennio, 4,153,378, Cl. 400-196.100.

Borden, Clarence W.: *See*—
Murray, William S., Jr.; and Borden, Clarence W., 4,153,080, Cl. 138-126.000.

Borg-Warner Corporation: *See*—
Brown, William L., 4,152,906, Cl. 64-15.00B.

Borggrefe, Gerhard; Moller, Hinrich; Lorenz, Peter; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Skin protection agents containing polyethercarboxylic acids. 4,153,726, Cl. 424-313.000.

Borkov, Gennady E.: *See*—
Litvak, Rafael S.; Rannev, Georgy G.; Anash, Shulim A.; Kim, Larisa P.; Pen-Chen-Sek, Alexandr I.; Borkov, Gennady E.; Nikiforov, Anatoly E.; Shutchenko, Vladimir G.; and Tabachnikov, Mikhail M., 4,153,521, Cl. 204-105.00R.

Boroschewski, Gerhard; and Arndt, Friedrich, to Schering Aktiengesellschaft. Herbicidal methylphenyl carbamates. 4,153,447, Cl. 71-111.000.

Borowski, Kurt; Stumpf, Friedrich; and Huber, Theodor, to AGFA-Gevaert A.G. Altered negative-feedback diaphragm control during implementation of image fadeover in a motion-picture camera. 4,153,352, Cl. 352-91.00C.

Boshagen, Horst: *See*—
Horlein, Ulrich; Boshagen, Horst; and Seuter, Friedel, 4,153,702, Cl. 424-267.000.

Bostock, Susan M.; Boyd, Violet; Fishwick, Brian R.; Glover, Brian; and Korn, Stewart R., to Imperial Chemical Industries Limited. Coloration process. 4,153,413, Cl. 8-41.00C.

Boulanger, Philippe; and Roure, Lucien, to Institut National de Recherche et de Securite pour la Prevention des Accidents du Travail et des Maladies Professionnelles. Vehicle seat assembly. 4,153,295, Cl. 297-307.000.

Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., to Delalande S.A. Certain N-5-[4,7-dimethoxy)-6-(monoalkylaminoethoxy, monocycloalkylaminoethoxy, or dialkylaminoethoxy) benzofuranyl], N'-methyl or ethyl ureas. 4,153,620, Cl. 260-346.730.

Bouyoucos, John V., to Hydroacoustics Inc. Apparatus for the generation of acoustic signals in marine environments. 4,153,135, Cl. 181-120.000.

Boyd, Keith A. Fan-fan drive assembly. 4,153,389, Cl. 416-93.00R.

Boyd, Violet: *See*—
Bostock, Susan M.; Boyd, Violet; Fishwick, Brian R.; Glover, Brian; and Korn, Stewart R., 4,153,413, Cl. 8-41.00C.

Boyer, James A., to General Motors Corporation. Circuit for producing a series of substantially square wave output signals. 4,153,850, Cl. 307-354.000.

Boykin, John C.; Bryan, Edward R.; and Pfautsch, Don A., to Electronic Flo-Meters, Inc. Remotely controlled retractable insertion flowmeter. 4,152,936, Cl. 73-198.000.

Boyle, William. Electric shock training device for animals. 4,153,009, Cl. 119-29.000.

Bozik, John E.: *See*—
Wu, Ching-Yong; Swift, Harold E.; and Bozik, John E., 4,153,635, Cl. 568-574.000.

Bracke, William J. I., to Labofina S. A. Process for producing expandable beads of vinyl aromatic polymer resins. 4,153,763, Cl. 521-60.000.

Bradbury, Edward T. & Charlotte L.: *See*—
Willis, William M., 4,153,003, Cl. 116-268.000.

Bradshaw, Mark R.: *See*—
Jones, Keith D.; Cowap, Geoffrey R.; and Bradshaw, Mark R., 4,153,935, Cl. 364-461.000.

Bradshaw, Thomas I.: *See*—
Seemann, Ronald W.; and Bradshaw, Thomas I., 4,153,156, Cl. 206-219.000.

Brady, Thomas E.; and Curto, Nicholas J., to Owens-Illinois, Inc. Method of forming articles from thermoplastic materials. 4,153,667, Cl. 264-532.000.

Braid, Milton, to Mobil Oil Corporation. Lubricant compositions containing benzotriazole-allyl sulfide reaction products. 4,153,563, Cl. 252-47.000.

Braid, Milton; and Landis, Phillip S., to Mobil Oil Corporation. Benzotriazole adduct and lubricant compositions containing said adduct. 4,153,565, Cl. 252-51.50A.

Braig, Siegfried: *See*—
Borggrefe, Gerhard; Moller, Hinrich; Lorenz, Peter; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,153,726, Cl. 424-313.000.

Brandow, Charles R.: *See*—
Berger, Harvey L.; and Brandow, Charles R., 4,153,201, Cl. 239-102.000.

Braton, Norman R.: *See*—
Acker, Jan R.; Braton, Norman R.; Koutsky, James A.; and Wendt, Robert F., 4,153,555, Cl. 210-198.00R.

Braun Aktiengesellschaft: *See*—
Heintke, Hans E.; Karey, Hans; and Oberheim, Robert, 4,153,359, Cl. 354-126.000.

Bregeon, Genevieve C.: *See*—
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., 4,153,620, Cl. 260-346.730.

Bristol-Myers Company: *See*—
Monkovic, Ivo; Bachand, Carol; and Wong, Henry, 4,153,603, Cl. 546-142.000.

Brockmiller, Robert L. Sliding hitch-ball holder and guide rack assembly. 4,153,270, Cl. 280-490.00R.

Brois, Stanley J.: *See*—
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., 4,153,566, Cl. 252-51.50A.

Bromley, Keith: *See*—
Catano, Paul S.; Monahan, Michael A.; and Bromley, Keith, 4,153,917, Cl. 360-10.000.

Brown, Donald J., to Knox Manufacturing Co. Transparency viewer assembly. 4,152,852, Cl. 40-361.000.

Brown, Kenneth R.: *See*—
Anderson, David; Brown, Kenneth R.; and Linklater, William L., 4,152,942, Cl. 74-5.00R.

Brown, Mitchell L.: *See*—
Laubenstein, Allan E.; Starich, Donald V.; and Brown, Mitchell L., 4,153,019, Cl. 123-117.00R.

Brown, William L., to Borg-Warner Corporation. Variable controlled spring pressure lock. 4,152,906, Cl. 64-15.00B.

Brueckner, Hubert U.: *See*—
Maffitt, Kent N.; Brueckner, Hubert U.; and Lowrey, Dean R., 4,153,654, Cl. 264-1.000.

Bruneau, Louis O., to Polaroid Corporation. Method of making a flat battery. 4,152,825, Cl. 29-623.200.

Brunninger, Manfred: *See*—
Theurer, Josef; and Brunninger, Manfred, 4,152,989, Cl. 104-2.000.
Theurer, Josef; and Brunninger, Manfred, 4,152,990, Cl. 104-6.000.

Bryan, Edward R.: *See*—
Boykin, John C.; Bryan, Edward R.; and Pfautsch, Don A., 4,152,936, Cl. 73-198.000.

Bryant, George M.: *See*—
Park, Kisoon; Bryant, George M.; and Carr, Frazier G., 4,153,778, Cl. 528-76.000.

Brzozowski, Zdzislaw; Magielka, Stanislaw; Angielski, Stefan; Janicki, Stanislaw; Wojcikowski, Czeslaw; and Jakubowski, Zenon, to Starogardzkie Zaklady Farmaceutyczne POLFA; and Akademia Medyczne. N-(4-[2-(pyrazole-1-carbonamide)-ethyl]-benzenesulphonyl)-urea. 4,153,710, Cl. 424-273.00P.

Buchan, William R., to Itek Corporation. Method and apparatus for increasing the visibility of low-contrast images. 4,153,335, Cl. 350-150.000.

Buchel, Karl H.: *See*—
Kramer, Wolfgang; Buchel, Karl H.; and Plempel, Manfred, 4,153,692, Cl. 424-245.000.
Kramer, Wolfgang; Buchel, Karl H.; and Plempel, Manfred, 4,153,708, Cl. 424-273.00R.

Buckley, Donald J.; Thaler, Warren A.; and Kennedy, Joseph P., to Exxon Research & Engineering Co. Isobutylene cyclodiolefin copolymers and terpolymers. 4,153,773, Cl. 526-308.000.

Buckley, Donald J.: *See*—
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 4,153,584, Cl. 260-5.000.

Budde, David L.: *See*—
Blume, Henry M., Jr.; Stamm, David A.; and Budde, David L., 4,153,933, Cl. 364-200.000.

Budrioli, Elio, to Compagnie Generale des Etablissements Michelin. Device for the recapping of tires. 4,153,497, Cl. 156-394.000.

Budzich, Tadeusz. Load responsive control valve. 4,153,075, Cl. 137-596.130.

Buechner, Oskar: *See*—
Boettcher, Klaus; Hoerdt, Heinrich G.; Zacher, Wieland; and Buechner, Oskar, 4,153,774, Cl. 526-352.200.
Buford, Wesley E.: *See*—
Bass, Melvin L.; and Buford, Wesley E., 4,153,302, Cl. 301-39.00T.
Bullard, Herbert L.; and Roduner, Larry D., to Goodyear Tire & Rubber Company, The. Hydrocarbon resin prepared from antimony pentafluoride or ferric chloride. 4,153,771, Cl. 526-221.000.
Bunker Ramo Corporation: *See*—
Hall, Stanley R.; and Benavides, Armando, 4,153,849, Cl. 307-295.000.
Bunyan, Thomas W., to Pilgrim Engineering Developments Limited. Pipe couplings. 4,153,280, Cl. 285-97.000.
Bunyan, Thomas W., to Pilgrim Engineering Developments Limited. Pipe joints. 4,153,656, Cl. 264-40.100.
Burchett, Keith L., to C.S. Johnson Company. Apparatus for actuating inner and outer forms of a concrete pipe forming mold. 4,153,232, Cl. 249-153.000.
Burgert, Albert, to Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel. Transition coding method for synchronous binary information and encoder and decoder employing the method. 4,153,814, Cl. 178-68.000.
Burke, William R., to National Gypsum Company. Bonded two piece metal stud. 4,152,873, Cl. 52-1.000.
Burnett, Harvey L. Medicament derived from Southern Wax Myrtle (*Myrica cerifera*) for arthritic conditions. 4,153,690, Cl. 424-195.000.
Burns, Everett M. Equal tensioned game net assembly. 4,153,247, Cl. 273-29.0BC.
Burroughs Corporation: *See*—
Dimyan, Magid Y.; and Unger, John C., 4,153,948, Cl. 365-28.000.
Mueller, Harry B., 4,152,826, Cl. 29-624.000.
Rau, John W., III; Muller, Harold H.; Tam, Richard K. W.; and Kabell, Louis J., 4,153,949, Cl. 365-104.000.
Spisz, Albert S.; and Woods, Daniel J., 4,153,142, Cl. 188-75.000.
Walton, Charles E., II, 4,152,827, Cl. 29-764.000.
Burroway, Gary L.; and Maximovich, Michael J., to Goodyear Tire & Rubber Company, The. Method of preparing a coating composition. 4,153,592, Cl. 260-29.60N.
Bussi, Giancarlo; and Baradel, Pierpaolo, to Aquila S.p.A. Halogenated polycondensates of fatty alcohol-acids for aqueous metal-working fluids and method of machining a metal with said fluids. 4,152,915, Cl. 72-42.000.
Bussiere, Guy: *See*—
Huchette, Michel; and Bussiere, Guy, 4,153,734, Cl. 426-250.000.
Buttner, Franz, deceased (by Widmer, Raoul Imseng and Urs, as agents for Allemeine Treuhand AG, Zurich, Switzerland, legal representatives), to Kastle (Schweiz) AG. Binding for cross-country skiing. 4,153,271, Cl. 280-615.000.
Buus, Jorn L. M.; and Lassen, Niels, to Kefalas A/S. Behenic acid esters, compositions thereof and a method of preparation thereof. 4,153,694, Cl. 424-247.000.
Byrne, Patrick J. Sports net. 4,153,246, Cl. 273-26.00A.
C.A.V. Limited: *See*—
Drori, Moshe, 4,153,027, Cl. 123-139.0AQ.
C. Cowles & Company: *See*—
Swisher, James A., 4,152,910, Cl. 70-159.000.
C.S. Johnson Company: *See*—
Burchett, Keith L., 4,153,232, Cl. 249-153.000.
C. van der Lely N. V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,152,993, Cl. 111-8.000.
Caddell, Richard W., to Kearney & Trecker Corporation. Timing circuit and method for controlling the operation of cyclical devices. 4,153,941, Cl. 364-900.000.
Calamani, Sergio: *See*—
Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, 4,153,214, Cl. 242-47.010.
Calin, Valentin: *See*—
Barozzi, Dan A.; Calin, Valentin; and Peter, Zsigmond, 4,153,195, Cl. 228-183.000.
Cameron Iron Works, Inc.: *See*—
Luke, Robert R., 4,153,112, Cl. 166-355.000.
Campbell, Colin D.: *See*—
Chamberlain, Terence R.; Campbell, Colin D.; and McCrae, James M., 4,153,601, Cl. 546-7.000.
Campbell, George A.: *See*—
Sundberg, Erik G.; Campbell, George A.; and Doucette, Edward L., 4,153,760, Cl. 429-252.000.
Campbell, Henry F.; Santora, Norman J.; and Douglas, George H., to William H. Rorer, Inc. Method of treatment. 4,153,722, Cl. 424-304.000.
Canada, Her Majesty the Queen in right of: *See*—
Hart, John A., 4,153,745, Cl. 427-244.000.
Canada Packers Limited: *See*—
Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., 4,153,613, Cl. 260-340.90R.
Canadair Limited: *See*—
Knap, Joseph, 4,152,870, Cl. 49-118.000.
Canadian General Electric Company, Ltd.: *See*—
Sack, Stanley F.; and Mattuck, Morris, 4,153,492, Cl. 156-172.000.
Cannon, Michael J.: *See*—
Clayfield, Eric J.; Pinnington, Clive; Cannon, Michael J.; and Sant, Peter, 4,153,419, Cl. 44-23.000.
Canon Kabushiki Kaisha: *See*—
Ikawa, Kazuo; Hirohata, Michio; Matsuda, Mutsuhide; and Mashimo, Yukio, 4,153,355, Cl. 354-33.000.
Kodaira, Noboru; Tezuka, Nobuo; Senuma, Mitio; Hashimoto, Teiji; Uchidoi, Masanori; and Iura, Yukio, 4,153,360, Cl. 354-241.000.
Tajima, Akira; and Kawamura, Naoto, 4,153,339, Cl. 350-184.000.
Toyomura, Shigeru; Kyogoku, Hiroshi; and Seki, Mitsuaki, 4,152,983, Cl. 101-93.230.
Capps, Spencer W.; Hagler, Gerald E.; and Abhiraman, Agaram S., to Akzona Incorporated. Melt spinning of synthetic yarns. 4,153,409, Cl. 425-72.00S.
Caramanian, John A. Concrete surface treating material and method of treating concrete surfaces. 4,153,743, Cl. 427-136.000.
Carbonnages de France: *See*—
Courbon, Paul, 4,152,923, Cl. 73-28.000.
Carl Freudenberg, Firma: *See*—
Bischoff, Dieter, 4,153,748, Cl. 428-57.000.
Carr, Frazier G.: *See*—
Park, Kisoon; Bryant, George M.; and Carr, Frazier G., 4,153,778, Cl. 528-76.000.
Carr-Griff, Inc.: *See*—
Hartley, Ezra D., 4,153,391, Cl. 417-269.000.
Carriere, Pierre: *See*—
Frechou, Georges; and Carriere, Pierre, 4,153,069, Cl. 137-238.000.
Carroll, John H. Focusing solar energy apparatus. 4,153,039, Cl. 126-271.000.
Carson Industries, Inc.: *See*—
Carson, John R., 4,153,176, Cl. 220-18.000.
Carson, John R., to Carson Industries, Inc. Meter box having rotatable cover and interlocking means. 4,153,176, Cl. 220-18.000.
Catano, Paul S.; Monahan, Michael A.; and Bromley, Keith, to United States of America, Navy. Image stabilizer system for stop-action playback. 4,153,917, Cl. 360-10.000.
Caterpillar Tractor Co.: *See*—
Freese, Gary P., 4,153,117, Cl. 172-809.000.
Gill, Stephen H., 4,153,167, Cl. 214-138.00R.
Oldenburg, Dorrance, 4,153,086, Cl. 144-34.00R.
Stedman, Robert N.; and Gee, James E., 4,152,991, Cl. 104-7.00R.
Cecchetto, Ennio: *See*—
Scherrer, Herbert; Bopp, Ernst; and Cecchetto, Ennio, 4,153,378, Cl. 400-196.100.
Cecere, Anthony F.: *See*—
Descovich, Theodore; Donadio, Louis F.; and Cecere, Anthony F., 4,153,662, Cl. 264-227.000.
Centre Technique des Industries Mecaniques: *See*—
Roche, Andre; and Schepacz, Charles, 4,153,524, Cl. 204-129.430.
Cerny, Elmer J., to Beltone Electronics Corporation. Hearing aid battery holder. 4,153,758, Cl. 429-98.000.
Cerroni, Manlio. Plant for the continuous production of paper-pulp from solid urban waste. 4,153,207, Cl. 241-46.170.
Certain-teed Corporation: *See*—
Beman, Donald K.; Faccioli, Edward A.; and Rimberg, David B., 4,153,432, Cl. 55-90.000.
Ceskoslovenska akademie ved: *See*—
Jelinek, Richard; Rychter, Zdenek; and Peterka, Miroslav, 4,153,676, Cl. 424-9.000.
Puffr, Rudolf; and Sebenda, Jan, 4,153,582, Cl. 252-511.000.
Chamberlain, Terence R.; Campbell, Colin D.; and McCrae, James M., to Ciba-Geigy Corporation. 4-Hydroxyquinolone-(2)-azomethine copper complex pigments. 4,153,601, Cl. 546-7.000.
Champion International Corporation: *See*—
Dutcher, Daniel P., 4,153,196, Cl. 229-1.50B.
Chan, Tai Y.: *See*—
Hounsfield, Godfrey N.; and Chan, Tai Y., 4,153,839, Cl. 250-366.000.
Chana, Howard E., to General Motors Corporation. Torque converter and torque engaged slipping clutch. 4,153,147, Cl. 192-3.280.
Chandalia, Kiran B.: *See*—
Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., 4,153,643, Cl. 260-861.000.
Chao, Wen-Kuei. Knock-out type automatic pencil. 4,153,379, Cl. 401-50.000.
Chaplin, George B. B.; Smith, Roderick A.; and Bearcroft, Robert G., to Sound Attenuators Limited. Active attenuation of recurring sounds. 4,153,815, Cl. 179-1.00P.
Charlas, Rene: *See*—
Mircovich, Jean-Louis; Macaire, Marcel; Charlas, Rene; and Le Floch, Gerard, 4,153,827, Cl. 200-144.00B.
Charles Stark Draper Laboratory, Inc., The: *See*—
Mamon, Glenn; Youmans, Douglas G.; and Volp, Jeffrey A., 4,153,366, Cl. 356-5.000.
Charmakadze, Revaz A.; and Chikovani, Rafael I. Semiconductor light-emitting device. 4,153,905, Cl. 357-16.000.
Chateau, Jean-Marie; Tavernier, Marc; and Descous, Paul, to Societe de Conditionnements en Aluminium Scal. Nozzle for feeding liquid metal to a continuous plate casting machine. 4,153,101, Cl. 164-428.000.
Chateau, Louis, to Ducellier & Cie. Ignition control device with monostable elements for providing a constant energy spark. 4,153,032, Cl. 123-148.00E.
Chatman, Arbery G. Ice cube dispensing device. 4,153,183, Cl. 222-185.000.
Chatterjee, Pallab K.: *See*—
Tasch, Al F., Jr.; Fu, Horng-Sen; Chatterjee, Pallab K.; and Hiller, William E., 4,153,904, Cl. 357-13.000.
Chauvier, D. J. V. D.: *See*—
Chauvier, Daniel J. V. D., 4,152,802, Cl. 15-1.700.

Chauvier, Daniel J. V. D., to Chauvier, D. J. V. D. Apparatus for cleaning submerged surfaces. 4,152,802. Cl. 15-1.700.

Cheape, Dudley W., Jr.; and Bankston, Charles E., to Monsanto Company. Method for removing unreacted monomers from a slurry. 4,153,787, Cl. 528-500.000.

Chedid, Louis: *See—*
Audibert, Francoise; Chedid, Louis; Lefrancier, Pierre; Choay, Jean; and Lederer, Edgar, 4,153,684, Cl. 424-88.000.

Chemetal Corporation: *See—*
Holzl, Robert A., 4,153,483, Cl. 148-31.500.

Chemische Werke Huels Aktiengesellschaft: *See—*
Schwesig, Helmut; Nordsiek, Karl-Heinz; and Kupper, Friedrich-Wilhelm, 4,153,772, Cl. 526-308.000.

Cheng, Chen-Yen; Cheng, Yu-Ling; and Cheng, Wu-Cheng. Process and apparatuses for contacting a gas phase and a liquid phase. 4,153,430, Cl. 55-84.000.

Cheng, Wu-Cheng: *See—*
Cheng, Chen-Yen; Cheng, Yu-Ling; and Cheng, Wu-Cheng, 4,153,430, Cl. 55-84.000.

Cheng, Yu-Ling: *See—*
Cheng, Chen-Yen; Cheng, Yu-Ling; and Cheng, Wu-Cheng, 4,153,430, Cl. 55-84.000.

Cherenko, Joseph; and Lewis, Charles W., to PPG Industries, Inc. Laminated windshield with improved innerlayer. 4,153,526, Cl. 204-159.210.

Chester, Richard J.: *See—*
Barth, Douglas A.; and Chester, Richard J., 4,153,150, Cl. 194-92.000.

Chestnut, Benjamin F.: *See—*
Stout, Garry A.; and Chestnut, Benjamin F., 4,152,954, Cl. 74-575.000.

Chevron Research Company: *See—*
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,153,482, Cl. 148-23.000.
Suzuki, Shigeto, 4,153,809, Cl. 562-583.000.

Chibnik, Sheldon, to Mobil Oil Corporation. Nitrogen-containing compounds and lubricant compositions containing same. 4,153,564, Cl. 252-51.50A.

Chikovani, Rafael I.: *See—*
Charmakadze, Revaz A.; and Chikovani, Rafael I., 4,153,905, Cl. 357-16.000.

Choay, Jean: *See—*
Audibert, Francoise; Chedid, Louis; Lefrancier, Pierre; Choay, Jean; and Lederer, Edgar, 4,153,684, Cl. 424-88.000.

Choksi, Pradip V., to American Hospital Supply Corporation. Lubricant for surgeon's gloves and method of applying same. 4,152,783, Cl. 2-168.000.

Choksi, Pradip V.: *See—*
Bishop, Robert C.; Choksi, Pradip V.; and Forstrom, Richard J., 4,153,050, Cl. 128-64.000.

Chopra, Ram K.; and Kramer, Daniel E., to Kramer Trenton Co., by said Ram Kumar Chopra. Refrigeration cooling unit with non-uniform heat input for defrost. 4,152,900, Cl. 62-80.000.

Christ, Nicholas: *See—*
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., 4,153,464, Cl. 106-14.270.

Christenson, Roger M.: *See—*
Zwack, Robert R.; and Christenson, Roger M., 4,153,545, Cl. 210-23.00F.

Christgau, Hermann; and Bodes, Ulrich, to Siemens Aktiengesellschaft. Radioluscent window structures. 4,153,854, Cl. 313-101.000.

Chua, Hua-Thye: *See—*
Ghest, Robert C.; Chua, Hua-Thye; and Birkner, John M., 4,153,938, Cl. 364-760.000.

Ciba-Geigy Corporation: *See—*
Bader, Jorg, deceased, 4,153,604, Cl. 546-22.000.
Chamberlain, Terence R.; Campbell, Colin D.; and McCrae, James M., 4,153,601, Cl. 546-7.000.
Deiner, Hans; Sandner, Bernhard; and Bernheim, Willy, 4,153,640, Cl. 260-827.000.
Desai, Nalin B., 4,153,618, Cl. 260-345.200.
Drabek, Jozef; and Meyer, Alfred, 4,153,723, Cl. 424-304.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,153,712, Cl. 424-273.00P.
Karrer, Friedrich, 4,153,731, Cl. 424-337.000.
Model, Ernst, 4,153,800, Cl. 548-305.000.
Mueller, Karl F., 4,153,590, Cl. 260-29.2EP.
Petitpierre, Jean C.; and Garner, Robert, 4,153,609, Cl. 260-326.14R.

Cimenti, Giovanni: *See—*
Mahr, Rene N.; and Cimenti, Giovanni, 4,153,140, Cl. 184-6.000.

Cipkowski, Jerome T., to United States of America, Army. Loading-unloading capability for cargo box transport vehicle. 4,153,169, Cl. 414-442.000.

Citizen Watch Co., Ltd.: *See—*
Namiki, Ryo; and Miyasaka, Kenzi, 4,152,888, Cl. 58-58.000.
Sekiguchi, Tsunetoshi, 4,152,889, Cl. 58-90.00B.

Clapot, Claude; Dumont, Louis; and Vial, Jean, to Philagro S.A. Methional derivatives and compositions with a growth regulating effect upon plants. 4,153,442, Cl. 71-88.000.

Clark, Kenneth D.; Jassawalla, Jal S.; and Portner, Peer M., to Andros Incorporated. Compensator for implanted blood pump. 4,152,786, Cl. 3-1.700.

Clark, William T., III. Method and apparatus for generating electricity. 4,153,757, Cl. 429-47.000.

Classic Products Corporation: *See—*
Fogel, Isaac, 4,152,796, Cl. 5-451.000.

Clayfield, Eric J.; Pinnington, Clive; Cannon, Michael J.; and Sant, Peter, to Shell Oil Company. Agglomeration of coal fines. 4,153,419, Cl. 44-23.000.

Clear-Vu, Inc.: *See—*
Andregg, James, 4,152,808, Cl. 15-250.070.

Clements, Porter; Basila, Michael R.; and Barry, James J., to Nalco Chemical Company. Catalytic gas purification process. 4,153,671, Cl. 423-244.000.

Clemson University: *See—*
Hester, Jarrett C., 4,152,904, Cl. 62-476.000.

Cleveland Clinic Foundation: *See—*
Magrini, Fabio, 4,153,048, Cl. 128-692.000.

Clews, K. Malcolm: *See—*
Kvapil, Rudolph; and Clews, K. Malcolm, 4,153,299, Cl. 299-2.000.
Kvapil, Rudolph; and Clews, K. Malcolm, 4,153,300, Cl. 299-2.000.

Clint, Inc.: *See—*
Marc, Michel, 4,153,254, Cl. 273-160.000.

Clodfelter, Glen A., to United States of America, Army. Coned joint for joining dissimilar diameter filament wound tubes. 4,153,282, Cl. 285-332.300.

Cluett, Peabody & Co., Inc.: *See—*
Lawrence, Jackson, 4,152,907, Cl. 68-5.00D.

Coal Industry (Patents) Limited: *See—*
Hillyar-Russ, Geoffrey, 4,153,375, Cl. 366-275.000.

Coburn, Orin W.: *See—*
Hovorka, Jiri J., 4,153,851, Cl. 310-23.000.

Cochran, Michael J., to Texas Instruments Incorporated. Charge transfer device radio system. 4,153,876, Cl. 325-15.000.

Coester, Erwin; Krapf, Heinz; Pfistermeister, Martin; Sartor, Bruno; and Mohrhauer, Hans, to Uranit Uran-Isotopentrennungs-Gesellschaft mbH. Method for forming an anticorrosive oxide layer on steels. 4,153,480, Cl. 148-6.350.

Cohen, Richard L.; and Anderson, Richard J., to Bendix Corporation, The. Dynamically compensated servo monitor. 4,153,865, Cl. 318-565.000.

Colgate-Palmolive Company: *See—*
Gersin, Robert P.; Totaro, Charles S.; Gebhardt, Roland; and Khovaylo, Modest, 4,152,803, Cl. 15-104.940.

Collegiate Cap and Gown Company: *See—*
Kincaid, Frank, 4,152,782, Cl. 2-74.000.

Colt Industries Operating Corp. (Pratt & Whitney Machine Tool Division): *See—*
Schachte, John J.; and Ross, Geoffrey A., 4,153,863, Cl. 318-341.000.

Cominco Ltd.: *See—*
Higgins, John T., 4,153,431, Cl. 55-85.000.

Commissariat a l'Energie Atomique: *See—*
Duchene, Jacques; and Meyer, Robert, 4,153,345, Cl. 350-363.000.
Pigeon, Michel; and Vienot, Claude, 4,153,875, Cl. 324-220.000.

Communications Patents Limited: *See—*
Gargini, Eric J., 4,153,847, Cl. 307-243.000.

Compagnie des Lampes: *See—*
Grauleau, Didier; Mourier, Jean; Shroff, Arvind; and Villain, Jacques, 4,153,041, Cl. 126-271.000.

Compagnie Generale de Radiologie: *See—*
Mayeux, Christian, 4,153,838, Cl. 250-368.000.

Compagnie Generale des Establissements Michelin: *See—*
Budrioli, Elio, 4,153,497, Cl. 156-394.000.

Compagnie Generale des Etablissements Michelin: *See—*
Pflieger, Bernard; and Reiniche, Andre, 4,153,099, Cl. 164-89.000.

Compton, Thomas A.: *See—*
Thornton, John A.; and Compton, Thomas A., 4,153,006, Cl. 118-63.000.

Computer Peripherals, Inc.: *See—*
Sapino, Anthony P.; Swatik, Donald S.; Costello, Robert E.; Malakian, Vahe H.; and Staugaard, Kenneth, 4,152,981, Cl. 101-93.010.

Coney, Charles H., to Eastman Kodak Company. Dielectric coating compositions derived from terephthalic acid-1,2-propane diol polyesters. 4,153,782, Cl. 528-302.000.

Conkle, Neil E. Machine for disassembling wood pallets. 4,152,819, Cl. 29-252.000.

Conradi, Eugene P.: *See—*
DePuydt, Frank A.; and Conradi, Eugene P., 4,153,143, Cl. 188-122.00R.

Conti, Nicholas R.; and Ferrara, Robert. Viewport assembly. 4,153,291, Cl. 296-193.000.

Continental Oil Company: *See—*
Edmond, Tibor O.; and Kestler, Kenneth C., 4,152,929, Cl. 73-581.000.
Edmond, Tibor O.; Schroeder, Rondon L.; and Smith, Clarence C., 4,153,119, Cl. 175-27.000.

Continental Scale Corporation: *See—*
Hutchinson, William Y.; and Kushmuk, Walter P., 4,153,125, Cl. 177-211.000.

Contreras, Gilbert & Dolores D.: *See—*
Willis, William M., 4,153,003, Cl. 116-268.000.

Control Data Corporation: *See—*
Bonnie, G. Patrick, 4,153,947, Cl. 365-6.000.

Conwed Corporation: *See—*
Weigand, Donald E., 4,153,488, Cl. 156-62.200.

Cook, James E., to Lear Siegler, Inc. Dual pump operation of coin-operated washing system. 4,153,393, Cl. 417-429.000.

Cook, Joseph G. Straight edge level. 4,152,838, Cl. 33-342.000.

Cooley, Benjamin D.: *See—*
Arbiter, Nathaniel; and Cooley, Benjamin D., 4,153,522, Cl. 204-106.000.

Coors, George T., to Ledex, Inc. Coil compressed solenoids subassembly. 4,153,890, Cl. 335-260.000.

Copeland Corporation: *See—*
Elson, John P.; and Bergman, Ernest R., 4,153,392, Cl. 417-372.000.

Copolymer Rubber & Chemical Corporation: *See—*
Tsai, Thomas C. H., 4,153,765, Cl. 526-48.100.

Cordell Engineering, Inc.: *See—*
Albano, Carlo J., 4,153,363, Cl. 354-299.000.

Corey, Harry S., III, to United States of America, Energy. Microinterferometer transducer. 4,153,370, Cl. 356-358.000.

Corning Glass Works: *See—*
Messing, Ralph A.; and Oppermann, Robert A., 4,153,510, Cl. 195-59.000.

Corrosion Service Company Limited: *See—*
Mueller, Walter A., 4,153,502, Cl. 162-17.000.

Costello, Robert E.: *See—*
Sapino, Anthony P.; Swatik, Donald S.; Costello, Robert E.; Malakian, Vahe H.; and Staugaard, Kenneth, 4,152,981, Cl. 101-93.010.

Cot, Louis: *See—*
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, 4,153,478, Cl. 148-6.15R.

Cote, Maurice R., to Sanders Associates, Inc. Low loss microwave switch. 4,153,888, Cl. 333-97.00S.

Cotten, Roger C. Method of joining plastic pipe to other pipe. 4,152,817, Cl. 29-157.00R.

Courbat, Pierre; and Albert, Alban, to ZYMA S.A. Process of preparing mono-O-β-hydroxyethyl-7 rutoside. 4,153,788, Cl. 536-8.000.

Courbon, Paul, to Carbonnages de France. Apparatus for selectively sampling dust and like solid particles granulometrically. 4,152,923, Cl. 73-28.000.

Cowap, Geoffrey R.: *See—*
Jones, Keith D.; Cowap, Geoffrey R.; and Bradshaw, Mark R., 4,153,935, Cl. 364-461.000.

Cox, Paul R., Jr., to Hercules Incorporated. Interlocked yarn and method of making same. 4,152,885, Cl. 57-207.000.

Cozine, Mark L.; Komancheck, John J.; and Riffanacht, John D., to Sperry Rand Corporation. Air tubulator on rotary screen. 4,153,436, Cl. 55-290.000.

Crasto, Lloyd T.; Jones, Robert H.; and Klock, John C., to Ethyl Corporation. Lead recovery and waste disposal process. 4,153,451, Cl. 75-77.000.

Cravitt, Samuel: *See—*
Kallet, Eli A.; and Cravitt, Samuel, 4,153,369, Cl. 356-318.000.

Credelle, Thomas L.: *See—*
Siekanowicz, Wieslaw W.; and Credelle, Thomas L., 4,153,856, Cl. 313-422.000.

Cross, Barrington, to American Cyanamid Company. Novel (alkenyloxy)-, (alkynyloxy) and (cyanoalkoxy) alkoxyphenyl ureas and their use as herbicides. 4,153,448, Cl. 71-120.000.

Cross, Charles K.: *See—*
Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., 4,153,613, Cl. 260-340.90R.

Cross, Michael A., to Westinghouse Electric Corp. Fiber optic interface junction assembly. 4,153,331, Cl. 350-96.200.

Crounse, Nathan N., to Sterling Drug Inc. Monoazo and diazo colorants from aminoalkylanilines and bis(aminoalkyl)anilines. 4,153,598, Cl. 260-185.000.

Crow, Lytle, Gilwee, Donoghue, Adler and Weineger: *See—*
Phillips, William R., 4,152,833, Cl. 30-382.000.

Csathy, Denis G.; Hung, Wendell L. Y.; and Pehoski, Charles J., to Deltak Corporation. Waste heat watertube boiler. 4,153,012, Cl. 122-7.00R.

Csepel Muvek Jarmu- Es Konfekcioipari Gepayara: *See—*
Domok, Istvan; Kocsis, Oliver; Banszki, Miklos; and Horvath, Jeno, 4,152,829, Cl. 30-139.000.

Csizi, Gotthard: *See—*
Boehn, Hugo; Treptow, Wolfram; Wunsch, Gerd; Kiener, Volker; Meyer, Hermann; and Csizi, Gotthard, 4,153,742, Cl. 427-126.000.

Cummings, William M.: *See—*
Powell, Justin C.; and Cummings, William M., 4,153,616, Cl. 260-343.500.

Cunningham, Russell E.: *See—*
Green, Wendel C.; Cunningham, Russell E.; Light, Gordon S.; Sharkitt, Patrick J.; and Webster, Charles W., 4,153,931, Cl. 364-200.000.

Curto, Nicholas J.: *See—*
Brady, Thomas E.; and Curto, Nicholas J., 4,153,667, Cl. 264-532.000.

Cushman, David W.: *See—*
Ondetti, Miguel A.; and Cushman, David W., 4,153,725, Cl. 424-309.000.

Custom Concepts, Incorporated: *See—*
Kubiatowicz, James F., 4,152,863, Cl. 46-1.00R.

D. A. B. Industries, Inc.: *See—*
Malinowski, Eugene F., 4,153,148, Cl. 192-87.170.

Dadowski, Gilbert F.; Mahr, Robert J.; and Drachman, Stanley P. Method and apparatus for printing raised ink images. 4,152,986, Cl. 101-463.000.

Dai Nippon Toryo Co., Ltd.: *See—*
Yano, Hirofumi; Okamura, Noriaki; and Toyoda, Tsunehiko, 4,153,467, Cl. 106-20.000.

Daicel Ltd.: *See—*
Sawada, Hideo; and Kawamoto, Junji, 4,153,064, Cl. 131-267.000.

Daido Tokushuko Kabushiki Kaisha: *See—*
Tanaka, Teruaki; and Haruna, Takayuki, 4,152,918, Cl. 72-238.000.

Daimler-Benz Aktiengesellschaft: *See—*
Barenyi, Bela; Haselmann, Heinrich; and Rieth, Egon, 4,153,290, Cl. 296-191.000.
Heitmeyer, Ulrich; Kupsa, Adrian; and Forster, Hans-Joachim, 4,153,128, Cl. 180-65.00E.

Dainichi-Nippon Cables, Ltd.: *See—*
Hashimoto, Makoto; Tomita, Yoshio; Nagatsuna, Fumio; Hirose, Masateru; and Tanno, Shogo, 4,153,179, Cl. 221-1.000.

Dana Corporation: *See—*
Joyner, Robert G., 4,153,260, Cl. 277-181.000.

Danninger, Karl. Aircraft temperature probe. 4,152,938, Cl. 73-349.000.

Dashiell, Robert A.: *See—*
Schmitz, William D.; Turpin, Richard H.; Dashiell, Robert A.; and Hadley, Chris L., 4,153,936, Cl. 364-493.000.

Daumiller, Guenther: *See—*
Graefje, Heinz; Nottes, Guenther; Mueller, Herbert; Daumiller, Guenther; and Hoffmann, Herwig, 4,153,425, Cl. 44-71.000.

David Manufacturing Co.: *See—*
Stille, Larry L., 4,152,840, Cl. 34-56.000.

Davidovitch, Zeev: *See—*
Korostoff, Edward; and Davidovitch, Zeev, 4,153,060, Cl. 128-419.00F.

Davies, Peter J.: *See—*
Vallance, Christopher; and Davies, Peter J., 4,153,530, Cl. 204-252.000.

Davies, Peter O., to Tullen Industries Limited. Tool holder. 4,152,831, Cl. 30-231.000.

Davis, Adrian F.; and Dixon, Gordon J. A., to Beecham Group Limited. Analgesic and anti-inflammatory compositions. 4,153,691, Cl. 424-230.000.

Davis, Alan R.: *See—*
Vandervoort, John R.; and Davis, Alan R., 4,152,949, Cl. 74-331.000.

Davis, James S.: *See—*
Saunders, John B.; and Davis, James S., 4,153,428, Cl. 55-26.000.

Davis, Larry R. Apparatus for and method of reclaiming and cleaning oil from bottom settlings of tanks. 4,153,553, Cl. 210-95.000.

Davis, Russ E.: *See—*
Weller, Robert A.; and Davis, Russ E., 4,152,934, Cl. 73-189.000.

de la Pena, Ramon: *See—*
MacKay, Patrick W.; Vera, Enrique M.; and de la Pena, Ramon, 4,153,450, Cl. 75-26.000.

Deflecta-Shield Corp.: *See—*
Redmond, Patrick J., 4,153,129, Cl. 180-68.00P.

Deguchi, Ryuichi: *See—*
Wakita, Nobuaki; and Deguchi, Ryuichi, 4,152,893, Cl. 60-290.000.

Deichert, William G.; Su, Kai C.; and van Buren, Martin F., to Bausch & Lomb Incorporated. Polysiloxane composition and contact lens. 4,153,641, Cl. 260-827.000.

Deiner, Hans; Sandner, Bernhard; and Bernheim, Willy, to Ciba-Geigy Corporation. Modified polysiloxanes and process of preparing them. 4,153,640, Cl. 260-827.000.

Delalande S.A.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., 4,153,620, Cl. 260-346.730.
Dimicoli, Jean-Luc; Wermuth, Camille G.; and Bieth, Joseph G., 4,153,688, Cl. 424-177.000.

de Lanauze, Jacques. Work preparation and ruling machine. 4,153,383, Cl. 408-26.000.

Delbende, Pierre; and Heraud, Jean P., to Exxon Research & Engineering Co. Sulphonic acid and sulphonates. 4,153,627, Cl. 260-505.00P.

Delet, Victoria. Brassiere underwire construction and method. 4,153,062, Cl. 128-476.000.

Delmar Chemicals Limited: *See—*
Kubela, Rudolf; Musil, Vaclav; and Hughes, Lise A., 4,153,789, Cl. 544-143.000.

DelMastro, Fiorentino G.: *See—*
Renzulli, Michael A.; and DelMastro, Fiorentino G., 4,153,831, Cl. 219-121.00P.

Delserro, Samuel; and Hsueh, Samuel B., to General Electric Company. Self-tightening clamp. 4,153,228, Cl. 248-74.0PB.

Delsing, Dale; and Fogelson, Mark, to Zenith Radio Corporation. Television cathode ray tube having getter flash tolerant internal resistive element. 4,153,857, Cl. 313-481.000.

Deltak Corporation: *See—*
Csathy, Denis G.; Hung, Wendell L. Y.; and Pehoski, Charles J., 4,153,012, Cl. 122-7.00R.

Deluxe Check Printers, Inc.: *See—*
Phillips, John W., 4,153,275, Cl. 281-17.000.

den Hollander, Jacob; and Rayno, Glenn D., to Advance Transformer Company. Capacitor winding apparatus and method. 4,153,493, Cl. 156-188.000.

Denka Chemical Corporation: *See—*
Barone, Bruno J., 4,153,577, Cl. 252-435.000.

Dennis, Jack B.; and Misunas, David P., to Massachusetts Institute of Technology. Data processing apparatus for highly parallel execution of stored programs. 4,153,932, Cl. 364-200.000.

DePuydt, Frank A.; and Conradi, Eugene P., to Dico Company, Inc. Trailer brake actuating assembly. 4,153,143, Cl. 188-122.00R.

Deritend Engineering Company Limited, The: *See—*
Bishop, Thomas D., 4,153,191, Cl. 226-143.000.

Desai, Nalin B., to Ciba-Geigy Corporation. Fluorescent pigments. 4,153,618, Cl. 260-345.200.

Desai, Nitin V.: *See—*
Poliniak, Eugene S.; and Desai, Nitin V., 4,153,741, Cl. 427-38.000.

DeSantis, Raymond P., to PTX-Pentronix, Inc. Multiple punch tool set for powder compacting press. 4,153,399, Cl. 425-78.000.

Descous, Paul: *See—*
Chateau, Jean-Marie; Tavernier, Marc; and Descous, Paul, 4,153,101, Cl. 164-428.000.

Descovich, Theodore; Donadio, Louis F.; and Cecere, Anthony F., to Avon Products, Inc. Method and apparatus for forming a jewelry nest. 4,153,662, Cl. 264-227.000.

Deters, Elmer M., to Wylain, Inc. Liquid dispensing and vapor recovery system and valve assembly utilized therein. 4,153,073, Cl. 137-493.400.

De Thomas, Waldo R.; and Hort, Eugene V., to GAF Corporation. Catalyst comprising Raney nickel with adsorbed molybdenum compound. 4,153,578, Cl. 252-438.000.

Detjen, Robert K., to McDonough Manufacturing Company. Sawmill apparatus. 4,152,960, Cl. 83-435.200.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co. Ltd. Automatic chromatic glissando. 4,152,966, Cl. 84-1.240.

Deutsche Automobilgesellschaft mbH, Firma: *See—*
Klink, Rainer; and Konig, Gunther, 4,153,127, Cl. 180-65.00R.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Kleemann, Axel; Klingler, Karl H.; von Schlichtegroll, Ansgar; Stroman, Fritz; Thiemer, Klaus; and Westermann, Erik, 4,153,696, Cl. 424-253.000.
Scherberich, Paul, 4,153,606, Cl. 260-306.70R.

De Villeneuve, Dail A. DC motor speed controller. 4,153,853, Cl. 318-341.000.

de Vleesschauwer, Walter F.; and Molyneux, Alan, to s.a. Texaco Belgium n.v. Use of ammonia in the formation of aromatic hydrocarbons by dehydroisomerizing alkylcyclopentane with a platinum hydrogen mordenite catalyst. 4,153,637, Cl. 585-405.000.

deVolpi, Charles P., to Perkins Papers Ltd. Packaging of gift wrap sheet material. 4,153,157, Cl. 206-225.000.

Devoogd, Albert H.: *See—*
Engels, Mathijs M. J.; and Devoogd, Albert H., 4,153,122, Cl. 177-25.000.

Dezawa, Shin-ichiro: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, 4,153,920, Cl. 360-55.000.

Diamond, Jack; Shipley, Neil J.; and Smith, John C., to Towmotor Corporation. Lifting eye and overhead guard mounting arrangement. 4,153,262, Cl. 280-5.00A.

Diana, Guy D., to Sterling Drug Inc. Aromatic diketones. 4,153,719, Cl. 424-282.000.

Dicks, Manfred: *See—*
Albert, Walter; Dicks, Manfred; and Schiedrum, Hans O., 4,153,408, Cl. 425-532.000.

Dico Company, Inc.: *See—*
DePuydt, Frank A.; and Conradi, Eugene P., 4,153,143, Cl. 188-122.00R.

Didde-Glaser, Incorporated: *See—*
Welborn, Ronald D., 4,152,985, Cl. 101-352.000.

Diem, Hans; Aicher, Albrecht; Haas, Hans; Dudeck, Christian; and Finkbeiner, Fritz, to BASF Aktiengesellschaft. Production of sulfur-free combustion gases of low soot content. 4,153,410, Cl. 431-5.000.

Dienes, Edward K.: *See—*
Hausberger, Arthur L.; and Dienes, Edward K., 4,153,580, Cl. 252-462.000.

Dierssen, Jurgen: *See—*
Winnacker, Helmut; and Dierssen, Jurgen, 4,153,357, Cl. 354-64.000.

Dietz, Milton S.; and McCune, William J., Jr., to Polaroid Corporation. Battery operated camera having means for mounting an external battery. 4,153,362, Cl. 354-293.000.

Dimicoli, Jean-Luc; Wermuth, Camille G.; and Bieth, Joseph G., to Delalande S.A. Trifluoromethylated oligopeptides. 4,153,688, Cl. 424-177.000.

Dimyan, Magid Y.; and Unger, John C., to Burroughs Corporation. Adjustable magnetic bias field structure for magnetic bubble devices. 4,153,948, Cl. 365-28.000.

Dinter, Peter; and Kolbe, Andreas, to Hoechst Aktiengesellschaft. Corona device and method for using same. 4,153,560, Cl. 250-531.000.

Director-General of the Agency of Industrial Science and Technology: *See—*
Matsuda, Akio, 4,153,795, Cl. 546-2.000.

Dits, Herbert R., to Transform Verstarkungsmaschinen Aktiengesellschaft. Method and apparatus for the shock pressure shaping. 4,152,921, Cl. 72-441.000.

Dittmann, Larry E.; Millhimes, Wayne L.; and Steinhauer, Glenn A., to AMP Incorporated. Stripper ring for a capsule-making machine. 4,153,406, Cl. 425-438.000.

Diversey Corporation, The: *See—*
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, 4,153,478, Cl. 148-6.15R.

Dixon, Gordon J. A.: *See—*
Davis, Adrian F.; and Dixon, Gordon J. A., 4,153,691, Cl. 424-230.000.

Dobbs, Harold L. Fast loader for muzzle-loader. 4,152,858, Cl. 42-90.000.

Dobkin, Robert C., to National Semiconductor Corporation. Gated collector lateral transistor structure and circuits using same. 4,153,909, Cl. 357-44.000.

Dr. Johannes Heidenhain GmbH.: *See—*
Nelle, Gunther; and Ernst, Alfons, 4,152,837, Cl. 33-125.00C.

Dolgoplosk, Boris A.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Dolinsek, Hans: *See—*
Thierer, Georg; and Dolinsek, Hans, 4,153,165, Cl. 414-133.000.

Domok, Istvan; Kocsis, Oliver; Banszki, Miklos; and Horvath, Jeno, to Csepel Muvek Jarmu- Es Konfekcioipari Gepayara. Cloth cutter with sharpener and cloth contacting parts are teflon coated. 4,152,829, Cl. 30-139.000.

Donadio, Louis F.: *See—*
Descovich, Theodore; Donadio, Louis F.; and Cecere, Anthony F., 4,153,662, Cl. 264-227.000.

Dornbush, Albert C.: *See—*
Messner, Eric J.; and Dornbush, Albert C., 4,153,512, Cl. 195-103.50K.

D'Ortenzio, Remo J., to Stromberg-Carlson Corporation. Digital conference circuit. 4,153,817, Cl. 179-18.0BC.

Dorzok, LeRoy D. Method of expanding shot tip. 4,152,820, Cl. 29-404.000.

Doucette, Edward I.: *See—*
Sundberg, Erik G.; Campbell, George A.; and Doucette, Edward I., 4,153,760, Cl. 429-252.000.

Douglas, George H.: *See—*
Campbell, Henry F.; Santora, Norman J.; and Douglas, George H., 4,153,722, Cl. 424-304.000.

Dow Chemical Company, The: *See—*
Garrou, Philip E., 4,153,605, Cl. 546-264.000.
Griffin, Thomas J., Jr., 4,153,066, Cl. 137-13.000.
Griffin, Thomas J., Jr., 4,153,649, Cl. 260-950.000.
Habermann, Clarence E., 4,153,581, Cl. 252-472.000.
McCarty, Leslie P., 4,153,636, Cl. 568-684.000.
Smith, William L., 4,153,466, Cl. 106-15.050.

Dowbenko, Rostyslaw: *See—*
Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, 4,153,776, Cl. 528-49.000.

Drabek, Jozef; and Meyer, Alfred, to Ciba-Geigy Corporation. Anthelmintic agents. 4,153,723, Cl. 424-304.000.

Drachman, Stanley P.: *See—*
Dadowski, Gilbert F.; Mahr, Robert J.; and Drachman, Stanley P., 4,152,986, Cl. 101-463.000.

Draisbach, Adolf: *See—*
Fiedler, Kurt H.; and Draisbach, Adolf, 4,153,272, Cl. 280-689.000.

Dresser Industries, Inc.: *See—*
Baron, George B., 4,153,166, Cl. 414-695.000.

Drori, Moshe, to C.A.V. Limited. Fuel injection pumping apparatus. 4,153,027, Cl. 123-139.0AQ.

Dual Gebruder Steidinger: *See—*
Kramer, Jurgen, 4,153,919, Cl. 360-129.000.

Dubal, Gajen P.: *See—*
Foreman, Robert W.; Dubal, Gajen P.; and Fox, Charles R., 4,153,481, Cl. 148-15.500.

DuBiel, Joseph T.; and Tyson, John P. Rifle bolt locking apparatus. 4,152,855, Cl. 42-16.000.

Dubois, Jean-Claude: *See—*
Gazard, Maryse; and Dubois, Jean-Claude, 4,153,925, Cl. 361-323.000.

Ducellier & Cie: *See—*
Chateau, Louis, 4,153,032, Cl. 123-148.00E.

Duchene, Jacques; and Meyer, Robert, to Commissariat a l'Energie Atomique. Electrolytic display device. 4,153,345, Cl. 350-363.000.

Dudeck, Christian: *See—*
Diem, Hans; Aicher, Albrecht; Haas, Hans; Dudeck, Christian; and Finkbeiner, Fritz, 4,153,410, Cl. 431-5.000.

Duff, Donald H. Apparatus for commutator replacement. 4,152,822, Cl. 29-564.500.

Dumbeck, Robert F. Heat storage systems. 4,153,047, Cl. 126-400.000.

Dumont, Louis: *See—*
Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,153,442, Cl. 71-88.000.

Dunks, Gary B.; and Beard, Charles D., to Union Carbide Corporation. Synthesis of tetradecahydroundecaborate (−1) from borohydride ion. 4,153,672, Cl. 423-287.000.

Dunlop Limited: *See—*
Ambrose, John, 4,153,079, Cl. 138-104.000.

Du Pont de Nemours, E. I., and Company: *See—*
Fang, James C., 4,153,520, Cl. 204-98.000.
Nelson, Thomas L., 4,152,886, Cl. 57-208.000.
Pruckmayr, Gerfried, 4,153,786, Cl. 528-408.000.
Reese, Cecil E., 4,153,660, Cl. 264-103.000.
Ver Nooy, Charles D., III; and Zinnato, Armand P., 4,153,414, Cl. 8-41.00R.

Durand, Jean-Henri: *See—*
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, 4,153,478, Cl. 148-6.15R.

Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., to Smith Kline & French Laboratories Limited. Ethylene derivatives. 4,153,704, Cl. 424-270.000.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Imidazo alkylamino pyrimidones. 4,153,793, Cl. 544-320.000.

Duren, Gottfried: *See—*
Bender, Hans; Zabel, Wolf; Duren, Gottfried; and Unkelbach, Karl-Heinz, 4,153,542, Cl. 209-223.00R.

Dutcher, Daniel P., to Champion International Corporation. Tub-shaped carton and blank for forming same. 4,153,196, Cl. 229-1.50B.

Duvall, Lee J. Removal and recovery of sulfur dioxide from stack gases. 4,153,437, Cl. 62-21.000.

Dykeman, Robert H.; and Wong, Man-Chong, to International Business Machines Corporation. Contoured quartz anode plate. 4,153,528, Cl. 204-192.00R.

Dzus Fastener Co. Inc.: *See—*
Wright, Andrew C. W., 4,153,284, Cl. 292-202.000.

E.C.H. WILL (GmbH & Co.): *See—*
Lemburg, Jorn-Uwe; and Stolley, Dieter, 4,153,081, Cl. 140-92.700.

E. J. Brooks Company: *See—*
Lundberg, George A., 4,152,909, Cl. 70-34.000.

E. R. Squibb & Sons, Inc.: *See—*
Hoehn, Hans, 4,153,796, Cl. 546-120.000.
Ondetti, Miguel A.; and Cushman, David W., 4,153,725, Cl. 424-309.000.

Eastman Kodak Company: *See—*
Coney, Charles H., 4,153,782, Cl. 528-302.000.
Hill, Doyle E.; and Sanford, Karl J., 4,153,668, Cl. 422-56.000.
Jackson, Winston J., Jr.; Gebeau, Gary G.; and Kuhfuss, Herbert F., 4,153,779, Cl. 528-176.000.
Neuberger, Dan; and Staples, Jon T., 4,153,459, Cl. 96-73.000.

Eaton Corporation: *See—*
Korczykowski, Lawrence L., 4,152,951, Cl. 74-474.000.
Vandervoort, John R.; and Davis, Alan R., 4,152,949, Cl. 74-331.000.

Eby, John C., Jr.: *See—*
Weisbrod, James G.; and Eby, John C., Jr., 4,153,895, Cl. 340-146.3AG.

Eckert, Guenter: *See—*
Horn, Peter; Leppmeier, Franz; Eckert, Guenter; and Fischer, Karl, 4,153,784, Cl. 528-338.000.

Eckhardt, Wolfgang: *See—*
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,153,712, Cl. 424-273.00P.

Edelman, Robert J.: *See—*
von der Heide, Jack; Edelman, Robert J.; and McLeod, Murray R., 4,153,554, Cl. 210-96.00M.

Edelmann, Hermann; Kraft, Peter; Mann, Karlheinz; Schuler, Peter; and Hagen, Alexander, to Boehringer Mannheim GmbH. Method and apparatus for the continuous determination of the concentration of an enzyme substrate. 4,153,513, Cl. 195-103.50R.

Edmond, Tibor O.; and Kestler, Kenneth C., to Continental Oil Company. Roof bolt tension determination. 4,152,929, Cl. 73-581.000.

Edmond, Tibor O.; Schroeder, Rondon L.; and Smith, Clarence C., to Continental Oil Company. Directional drilling apparatus. 4,153,119, Cl. 175-27.000.

Efremov, Stanislav V.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Egli, Werner, to Armaturenfabrik Wallisellen AG. Hot and cold water mixing valve. 4,153,077, Cl. 137-625.170.

Eilingsfeld, Heinz; and Seybold, Guenther, to BASF Aktiengesellschaft. Process for the production of 4,5-disubstituted thiazoles. 4,153,607, Cl. 260-306.80F.

Eiselstein, Herbert L.; and Lingenfelter, Allen C., to Huntington Alloys, Inc. High temperature nickel-base alloys. 4,153,455, Cl. 75-171.000.

Eki, Yurio; Tennichi, Yasuhiro; and Honda, Naganobu, to Hitachi, Ltd. Electro-hydraulic governor employing duplex digital controller system. 4,153,198, Cl. 235-303.300.

Electronic Flo-Meters, Inc.: *See—*
Boykin, John C.; Bryan, Edward R.; and Pfautsch, Don A., 4,152,936, Cl. 73-198.000.

Elhaus, Friedrich W. Hot shearing apparatus. 4,152,959, Cl. 83-123.000.

Elhaus, Friedrich W. Preheating furnace. 4,153,236, Cl. 266-252.000.

Eli Lilly and Company: *See—*
Balko, Terry W.; and Hackler, Ronald E., 4,153,701, Cl. 424-263.000.
Beck, James R.; and Gajewski, Robert P., 4,153,730, Cl. 424-330.000.
Paget, Charles J.; and Sands, John L., 4,153,709, Cl. 424-273.00B.
Turner, William W., 4,153,695, Cl. 424-251.000.

Ellis, John S.: *See—*
Ellis, Larry C.; and Ellis, John S., 4,153,145, Cl. 188-274.000.

Ellis, Larry C.; and Ellis, John S., to Ace Controls, Inc. Heavy duty hydraulic shock absorber. 4,153,145, Cl. 188-274.000.

Ellmer, David, to Hoover, John. Fireplace heating system. 4,153,199, Cl. 236-9.00A.

Elly, Robert A.; and Foti, Sam J., to Neff-Perkins Company. Three-deck vulcanizing press. 4,153,405, Cl. 425-338.000.

Elson, John P.; and Bergman, Ernest R., to Copeland Corporation. Refrigeration compressor lubrication. 4,153,392, Cl. 417-372.000.

Emery Industries, Inc.: *See—*
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., 4,153,464, Cl. 106-14.270.

EMI Limited: *See—*
Hounsfield, Godfrey N.; and Chan, Tai Y., 4,153,839, Cl. 250-366.000.

Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, to Kawasaki Steel Corporation. Steel materials having an excellent hydrogen induced cracking resistance. 4,153,454, Cl. 75-124.000.

Emmett, John C.: *See—*
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,153,704, Cl. 424-270.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,153,793, Cl. 544-320.000.

Engelhardt: *See—*
Atkinson, Joseph G.; Rooney, Clarence S.; Girard, Yves; and Engelhardt, 4,153,715, Cl. 424-274.000.

Engels, Mathijs M. J.; and Devoogd, Albert H., to Maatschappij Van Berkel's Patent N.V. Weighing apparatus. 4,153,122, Cl. 177-25.000.

English, George J.; and Fohl, Timothy, to GTE Sylvania Incorporated. Portable copier using flash lamp article. 4,153,365, Cl. 355-99.000.

Environmental Industrial Products: *See—*
Muther, Richard M., 4,153,552, Cl. 210-82.000.

Envirotech Corporation: *See—*
Black, Brent C.; and Hill, P. Larry, 4,153,071, Cl. 137-386.000.
Isheim, Maynard C., 4,153,411, Cl. 432-27.000.

Erfeling, Arthur, to Lohmann-Apparatebau GmbH. Device for feeding animals. 4,153,010, Cl. 119-52.0AF.

Erno Raumfahrttechnik GmbH: *See—*
Rex, Dietrich, 4,153,474, Cl. 136-89.0PC.

Ernst, Alfons: *See—*
Nelle, Gunther; and Ernst, Alfons, 4,152,837, Cl. 33-125.00C.

Errede, Louis A.: *See—*
Ree, Buren R.; Errede, Louis A.; Jefson, Gary B.; and Langager, Bruce A., 4,153,661, Cl. 264-120.000.

Ertl, Edward S., to Acoustics Development Corporation. Telephone booth mounting arrangement. 4,152,874, Cl. 52-27.000.

Espitalie, Jean; Laporte, Jean-Loup; Madec, Marcel; and Marquis, Francois, to Institut Francais du Petrole. Method for determining oil-related characteristics of geological sediments from small samples thereof. 4,153,415, Cl. 23-230.0EP.

Etablissements DEBOR: *See—*
Bereyziat, Daniel, 4,153,123, Cl. 177-147.000.

Etablissements Genoud & Cie: *See—*
Neyret, Guy, 4,153,233, Cl. 251-127.000.

Etes, Donald E., to Northern Illinois Research, Inc. Plastic composition manufacture thereof, and pad formed therewith. 4,153,055, Cl. 128-156.000.

Ethyl Corporation: *See—*
Crasto, Lloyd T.; Jones, Robert H.; and Klock, John C., 4,153,451, Cl. 75-77.000.
Haefner, Albert J.; and Kucsma, Michael E., 4,153,206, Cl. 241-14.000.

Euteco S.p.A.: *See—*
Pellizzon, Tullio; Piccolo, Luigi; and Paolinelli, Antonio, 4,153,472, Cl. 106-304.000.

Ewing, Bruce A.; and Herman, Marvin, to General Motors Corporation. Method of manufacturing a hybrid turbine rotor. 4,152,816, Cl. 29-156.80R.

Exxon Research & Engineering Co.: *See—*
Buckley, Donald J.; Thaler, Warren A.; and Kennedy, Joseph P., 4,153,773, Cl. 526-308.000.
Delbende, Pierre; and Heraud, Jean P., 4,153,627, Cl. 260-505.00P.
Feng, I-Ming; and Shaub, Harold, 4,152,927, Cl. 73-60.000.
Jaruzelski, John J., 4,153,562, Cl. 252-46.600.
Makowski, Henry S.; Klein, Robert R.; and Lundberg, Robert D., 4,153,588, Cl. 260-23.50A.
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., 4,153,566, Cl. 252-51.50A.
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 4,153,584, Cl. 260-5.000.
Wisotsky, Max J., 4,153,422, Cl. 44-62.000.
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Wisotsky, Max J., 4,153,424, Cl. 44-62.000.

Ezawa, Tabashi: *See—*
Koide, Tohru; Ezawa, Tabashi; Onoda, Hideki; Masaki, Chiharu; and Morita, Tohru, 4,153,766, Cl. 526-59.000.

Ezoe, Mitsuhiko: *See—*
Asano, Masaharu; and Ezoe, Mitsuhiko, 4,153,022, Cl. 123-119.0EC.

Ezzell, Hershel L. Metric conversion board. 4,152,845, Cl. 35-7.00R.

Faccioli, Edward A.: *See—*
Beman, Donald K.; Faccioli, Edward A.; and Rimberg, David B., 4,153,432, Cl. 55-90.000.

Faehling, Francis L.: *See—*
Billmeyer, Thomas F.; and Faehling, Francis L., 4,153,036, Cl. 126-121.000.

Falbel, Gerald; and Spangenberg, Peter E., to United States of America, Navy. Electro-optical detector protection device. 4,153,368, Cl. 356-225.000.

Falk, Edward J., to Wagner Electric Corporation. Tandem brake master cylinder. 4,152,897, Cl. 60-562.000.

Fang, James C., to Du Pont de Nemours, E. I., and Company. Method for the electrolytic production of chlorine from brine. 4,153,520, Cl. 204-98.000.

Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, to Rhone-Poulenc Industries. Isoquinoline derivatives and pharmaceutical compositions containing them. 4,153,698, Cl. 424-258.000.

Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, to Rhone-Poulenc Industries. Thiazolo[3,4-a]indole derivatives and pharmaceutical compositions containing them. 4,153,699, Cl. 424-258.000.

Farmer, William C., to High Point, Incorporated. Method of producing high quality photographs on microfiche. 4,153,456, Cl. 96-27.00R.

Farrand Optical Co., Inc.: *See*—
Kallet, Eli A.; and Cravitt, Samuel, 4,153,369, Cl. 356-318.000.

Fathauer, George H.; and Holst, Wayne L., to Masco Corporation of Indiana. Mobile CB transceiver. 4,153,877, Cl. 325-25.000.

Faul, Wolfgang; and Kastening, Bertel, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for electrochemically processing metallic surfaces. 4,153,531, Cl. 204-263.000.

Fava, Lawrence. Transparent radiation wall. 4,153,845, Cl. 250-517.000.

Federal-Mogul Corporation: *See*—
Ladin, Eli M., 4,153,308, Cl. 308-189.00R.

Fehlhaber, Hans-Wolfram: *See*—
Hornke, Ingolf; Fehlhaber, Hans-Wolfram; and Uihlein, Michael, 4,153,697, Cl. 424-258.000.

Feingold, Robert M., to United States of America, Army. Method of making a plate having a pattern of microchannels. 4,153,855, Cl. 313-105.0CM.

Feng, I-Ming; and Shaub, Harold, to Exxon Research & Engineering Co. Viscosity simulator. 4,152,927, Cl. 73-60.000.

Fenne, Ivor, to Lucas Industries Limited. Fuel injection nozzles. 4,153,200, Cl. 239-94.000.

Feres, Vaclav. Thin film coating evaporator. 4,153,500, Cl. 159-6.00R.

Ferguson, Alan N., to Minnesota Mining and Manufacturing Company. Sorbent materials. 4,153,505, Cl. 162-164.00R.

Fern, William A.; and Rodriguez, Philip A. B., to Imperial Chemical Industries Limited. Preparation of organic isocyanates. 4,153,624, Cl. 260-453.00P.

Fernique, Bernard, to Somifra (Societe d'Outillage et de Mecanique de l'Ile-de France). Automatic device for supplying an injection machine with a material such as an elastomer. 4,153,180, Cl. 222-56.000.

Ferralli, Michael W., to Lord Corporation. Muffler. 4,153,136, Cl. 181-252.000.

Ferranti Limited: *See*—
Anderson, David; Brown, Kenneth R.; and Linklater, William L., 4,152,942, Cl. 74-5.00R.

Ferrara, Robert: *See*—
Conti, Nicholas R.; and Ferrara, Robert, 4,153,291, Cl. 296-193.000.

Fibre-Metal Products Company, The: *See*—
Walters, Eugene G.; and Ruck, Heinz E., 4,153,348, Cl. 351-118.000.

Fiedler, Kurt H.; and Draisbach, Adolf, to General Motors Corporation. Torsion rod stabilizer assemblies for vehicular steerable front wheels. 4,153,272, Cl. 280-689.000.

Figallo, Eleazar. Method of reducing malar fractures using a hammer disimpactor. 4,153,053, Cl. 128-92.00E.

Fil, Vyacheslav G.: *See*—
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Fink, Peter; Wild, Hans; Zizlsperger, Johann; Reffert, Rudi W.; and Thielen, Gunter, to BASF Aktiengesellschaft. Process and apparatus for removing vaporizable constituents from viscous solutions or melts of thermoplastics. 4,153,501, Cl. 159-49.000.

Finkbeiner, Fritz: *See*—
Diem, Hans; Aicher, Albrecht; Haas, Hans; Dudeck, Christian; and Finkbeiner, Fritz, 4,153,410, Cl. 431-5.000.

Fischer, Albert: *See*—
Woodman, Trevor P.; and Fischer, Albert, 4,153,753, Cl. 428-409.000.

Fischer, Karl; and Barth, Klaus, to Fischer, Karl. Electric hot plate assembly with a temperature limiter. 4,153,833, Cl. 219-449.000.

Fischer, Karl: *See*—
Horn, Peter; Leppmeier, Franz; Eckert, Guenter; and Fischer, Karl, 4,153,784, Cl. 528-338.000.

Fischer, William A. Ammonia absorber. 4,153,435, Cl. 55-227.000.

Fisher, Charles B.; and Fisher, Sidney T. High-efficiency amplifier. 4,153,882, Cl. 330-10.000.

Fisher Scientific Company: *See*—
Messner, Eric J.; and Dornbush, Albert C., 4,153,512, Cl. 195-103.50K.

Fisher, Sidney T.: *See*—
Fisher, Charles B.; and Fisher, Sidney T., 4,153,882, Cl. 330-10.000.

Fishwick, Brian R.: *See*—
Bostock, Susan M.; Boyd, Violet; Fishwick, Brian R.; Glover, Brian; and Korn, Stewart R., 4,153,413, Cl. 8-41.00C.

Fitch, Robert H.; Kurtz, Bruce E.; and Rothmayer, Noel Y., to Allied Chemical Corporation. Apparatus for disassembly of a plural cell electrolyzer. 4,153,532, Cl. 204-267.000.

Flora, Raymond A., to General Motors Corporation. Electric switch and actuator for an antenna drive system. 4,153,825, Cl. 200-47.000.

Flournoy, Kenoth H.: *See*—
Kalfoglou, George; and Flournoy, Kenoth H., 4,153,573, Cl. 252-312.000.
Kalfoglou, George; and Flournoy, Kenoth H., 4,153,575, Cl. 252-352.000.

Flow Technology, Inc.: *See*—
Francisco, Edward E., Jr., 4,152,922, Cl. 73-3.000.

Fogel, Isaac, to Classic Products Corporation. Waterbed mattress. 4,152,796, Cl. 5-451.000.

Fogelson, Mark: *See*—
Delsing, Dale; and Fogelson, Mark, 4,153,857, Cl. 313-481.000.

Fohl, Timothy: *See*—
English, George J.; and Fohl, Timothy, 4,153,365, Cl. 355-99.000.

Foley, Michael S., to USM Corporation. Cut-clinch mechanism for variably spaced leads. 4,153,082, Cl. 140-105.000.

Ford Motor Company: *See*—
Janotik, Adam M., 4,153,868, Cl. 322-48.000.
Power, James H.; and Akman, Ahmet R., 4,153,030, Cl. 123-146.50A.

Ford, William D.: *See*—
Vasalos, Iacovos A.; Ford, William D.; and Hsieh, Chuan-Kang R., 4,153,535, Cl. 208-120.000.

Ford, William R., Jr.: *See*—
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., 4,153,464, Cl. 106-14.270.

Foreman, Robert W.; Dubal, Gajen P.; and Fox, Charles R., to Park Chemical Company. Cyanide-free carburizing process and composition. 4,153,481, Cl. 148-15.500.

Forney, Steven W., to Nalco Chemical Company. Process for controlling pollution and contamination in the electrodeposition of paint. 4,153,548, Cl. 210-52.000.

Forsheda Gummifabrik AB: *See*—
Torstensson, Tommy, 4,153,259, Cl. 277-75.000.

Forster, Hans-Joachim: *See*—
Heitmeyer, Ulrich; Kupsa, Adrian; and Forster, Hans-Joachim, 4,153,128, Cl. 180-65.00E.

Forstrom, Richard J.: *See*—
Bishop, Robert C.; Choksi, Pradip V.; and Forstrom, Richard J., 4,153,050, Cl. 128-64.000.

Foti, Sam J.: *See*—
Elly, Robert A.; and Foti, Sam J., 4,153,405, Cl. 425-338.000.

Fox, Charles R.: *See*—
Foreman, Robert W.; Dubal, Gajen P.; and Fox, Charles R., 4,153,481, Cl. 148-15.500.

Fox, Richard C.: *See*—
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,153,482, Cl. 148-23.000.

Francisco, Edward E., Jr., to Flow Technology, Inc. Apparatus and method for determining the characteristic of a flowmeter. 4,152,922, Cl. 73-3.000.

Frantz, Robert H.; and Zimmerman, John A., Jr., to AMP Incorporated. Hermaphroditic wiring system. 4,153,326, Cl. 339-99.00R.

Franz Buttner AG.: *See*—
Scherrer, Herbert; Bopp, Ernst; and Cecchetto, Ennio, 4,153,378, Cl. 400-196.100.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft, m.b.H.: *See*—
Theurer, Josef; and Brunninger, Manfred, 4,152,989, Cl. 104-2.000.
Theurer, Josef; and Brunninger, Manfred, 4,152,990, Cl. 104-6.000.

Fraser, Donald S., to Babcock and Wilcox of Africa. Grinders. 4,153,209, Cl. 241-103.000.

Fravel, Ralph P.; and Godec, Ciril J., to Minnesota Mining and Manufacturing Company. Urinary incontinence stimulator system. 4,153,059, Cl. 128-422.000.

Frechin, Jean-Paul; and Gabrielli, Andrea, to Garcia Corporation, The. Ski boot. 4,152,849, Cl. 36-120.000.

Frechou, Georges; and Carriere, Pierre, to Societe Nationale Industrielle Aerospatiale. Gate valves. 4,153,069, Cl. 137-238.000.

Freese, Gary P., to Caterpillar Tractor Co. Cushion dozer with three point attachment support. 4,153,117, Cl. 172-809.000.

French, Gordon B.: *See*—
McCarthy, Harry E.; and French, Gordon B., 4,153,298, Cl. 299-2.000.

Fried, Michael W.: *See*—
Weissman, Richard; Haack, Christian H.; and Fried, Michael W., 4,153,011, Cl. 119-72.000.

Friedemann, Wolfgang: *See*—
Guinomet, Yves; Tenhaven, Ulrich; Wrede, Wilhelm; Schoenemann, Rudolf; Friedemann, Wolfgang; Groschopp, Heinz; and Germscheid, Hans G., 4,152,916, Cl. 72-42.000.

Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Amide-modified urethane acrylate radiation curable compounds and coating compositions and methods of making same. 4,153,776, Cl. 528-49.000.

Friedrich, Ernst: *See*—
Vetter, Heinz; and Friedrich, Ernst, 4,153,663, Cl. 264-286.000.

Frielingsdorf, Frank J.: *See*—
Wittenberg, Roland C.; Alexandrovich, George; and Frielingsdorf, Frank J., 4,153,257, Cl. 274-39.00R.

Friggens, Gary R.: *See*—
Bissett, Larry A.; Friggens, Gary R.; and McGee, James P., 4,153,427, Cl. 48-86.00R.

Fryer, Rodney I.: *See*—
Gilman, Norman; and Fryer, Rodney I., 4,153,799, Cl. 548-378.000.

Frykhult, Rune H., to AB Celleco. Hydrocyclone separator. 4,153,558, Cl. 210-512.00R.

Fu, Horng-Sen: *See—*
Tasch, Al F., Jr.; Fu, Horng-Sen; Chatterjee, Pallab K.; and Hiller, William E., 4,153,904, Cl. 357-13.000.
Fuji Photo Film Co., Ltd.: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, 4,153,920, Cl. 360-55.000.
Fuji Photo Optical Co., Ltd.: *See—*
Harada, Yuho; Hiramatu, Kenzo; Hasegawa, Katsuhito; and Ishibashi, Kuniaki, 4,153,333, Cl. 350-96.250.
Fujii, Toru, to Olympus Optical Co., Ltd. Wide-angle zoom lens system. 4,153,338, Cl. 350-184.000.
Fujimoto, Shoji; and Matsushima, Tatsuo, to Koyo Seiko Company Limited. Torque-measuring device. 4,152,930, Cl. 73-136.00R.
Fujisawa, Hiromichi: *See—*
Yasuda, Michio; Nakano, Yasuaki; Fujisawa, Hiromichi; and Hananoi, Toshihiro, 4,153,897, Cl. 340-146.30Q.
Fujitsu Limited: *See—*
Miwa, Hirohide; Oikawa, Kiyoshi; and Iizuka, Yoshio, 4,153,916, Cl. 358-257.000.
Shinoda, Masaichi; Nakamura, Tetsuo; and Yamamoto, Minoru, 4,153,906, Cl. 357-23.000.
Fujiwara, Akitoshi: *See—*
Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, 4,153,454, Cl. 75-124.000.
Fukuda, Masataro: *See—*
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,153,484, Cl. 148-32.000.
Fukuichi, Takuro, to Kabushiki Kaisha Daini Seikosha. Digital electronic alarm timepiece. 4,152,887, Cl. 58-19.00R.
Fukushima, Hisao: *See—*
Ueda, Joji; and Fukushima, Hisao, 4,153,822, Cl. 179-103.000.
Fukushima, Kiyoshi: *See—*
Hayakawa, Akifumi; Aiba, Akira; Orihara, Eiki; and Fukushima, Kiyoshi, 4,153,231, Cl. 249-82.000.
Fulmer, Keith H., to Bendix Corporation, The. Brake pedal linkage mechanism. 4,152,952, Cl. 74-517.000.
Furuta, Seiya: *See—*
Ogata, Kazuo; and Furuta, Seiya, 4,153,485, Cl. 148-126.000.
Futamura, Kenichiro: *See—*
Iwahana, Keiichi; Mathuda, Yoshimi; and Futamura, Kenichiro, 4,153,756, Cl. 428-653.000.
Fylling, Tor T. Torque applicator. 4,152,972, Cl. 92-33.000.
G. D. Searle & Co.: *See—*
Renbarger, Jerry J.; and Yonan, Peter K., 4,153,797, Cl. 546-237.000.
Gabrielli, Andrea: *See—*
Frechin, Jean-Paul; and Gabrielli, Andrea, 4,152,849, Cl. 36-120.000.
GAF Corporation: *See—*
De Thomas, Waldo R.; and Hort, Eugene V., 4,153,578, Cl. 252-438.000.
Schneider, Louis; and Graham, David E., 4,153,446, Cl. 71-95.000.
Gagliani, John; and Long, John V., to International Harvester Company. Copolyimides. 4,153,783, Cl. 528-337.000.
Gaidis, James M.: *See—*
Rosenberg, Arnold M.; and Gaidis, James M., 4,153,473, Cl. 134-5.000.
Gajewski, Robert P.: *See—*
Beck, James R.; and Gajewski, Robert P., 4,153,730, Cl. 424-330.000.
Gamaunt, Roger L. Fluid self-centering vibration and shock mount. 4,153,227, Cl. 248-575.000.
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, to Matsushita Electric Industrial Co., Ltd. Hydrogen storage material. 4,153,484, Cl. 148-32.000.
Gandrud, Merlin H.; and Woelffer, Neill C., to Jacobsen Manufacturing Company. Lawn mower with catcher accommodation. 4,152,884, Cl. 56-202.000.
Ganellin, Charon R.: *See—*
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,153,704, Cl. 424-270.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,153,793, Cl. 544-320.000.
Gantmakher, Anna R.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.
Garcia Corporation, The: *See—*
Frechin, Jean-Paul; and Gabrielli, Andrea, 4,152,849, Cl. 36-120.000.
Gardner, Derek V., to Beecham Group Limited. Anorexic chromans. 4,153,617, Cl. 260-345.200.
Gargini, Eric J., to Communications Patents Limited. Logic circuits. 4,153,847, Cl. 307-243.000.
Garner, Eugene F., to Allied Chemical Corporation. Pyrotechnic composition and method of inflating an inflatable automobile safety restraint. 4,152,891, Cl. 60-205.000.
Garner, Robert: *See—*
Petitpierre, Jean C.; and Garner, Robert, 4,153,609, Cl. 260-326.14R.
Garrett Corporation, The: *See—*
Silver, Alexander; and Wenban, James R., 4,153,315, Cl. 308-9.000.
Garrett, Donald E.; and Mallan, George M., to Occidental Petroleum Corporation. Pyrolysis process for solid wastes. 4,153,514, Cl. 201-2.500.
Garrou, Philip E., to Dow Chemical Company, The. Process for preparing bispicolylamine. 4,153,605, Cl. 546-264.000.
Garshin, Anatoly P.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.
Garvin, Donald F.; and Aepli, Otto T., to BASF Wyandotte Corporation. Heat dependent alkali gel cleaning compositions and process for cleaning greasy surfaces. 4,153,571, Cl. 252-156.000.
Garvin, Hugh L.: *See—*
Little, Michael J.; Garvin, Hugh L.; and Lee, Yat-Shir, 4,153,529, Cl. 204-192.0EC.
Gatzke, Ronald D.; Larsen, James L.; and Simons, Elliott S., to Hewlett-Packard Company. Apparatus for maintaining signals within a given amplitude range. 4,153,049, Cl. 128-419.00D.
Gazard, Maryse; and Dubois, Jean-Claude, to Thomson-CSF. Dielectric formed by a thin-layer polymer, a process for producing said layer and electrical capacitors comprising this dielectric. 4,153,925, Cl. 361-323.000.
Gebeau, Gary G.: *See—*
Jackson, Winston J., Jr.; Gebeau, Gary G.; and Kuhfuss, Herbert F., 4,153,779, Cl. 528-176.000.
Gebhardt, Roland: *See—*
Gersin, Robert P.; Totaro, Charles S.; Gebhardt, Roland; and Khovaylo, Modest, 4,152,803, Cl. 15-104.940.
Gee, James E.: *See—*
Stedman, Robert N.; and Gee, James E., 4,152,991, Cl. 104-7.00R.
General Cable Corporation: *See—*
Settlemyer, Bernard W., 4,153,434, Cl. 55-163.000.
General Electric Company: *See—*
Barkan, Philip, 4,153,828, Cl. 200-153.0SC.
Delserro, Samuel; and Hsueh, Samuel B., 4,153,228, Cl. 248-74.0PB.
Herrick, Carlyle S., 4,152,899, Cl. 62-4.000.
Kresge, James S.; and Menelly, Richard A., 4,153,921, Cl. 361-40.000.
MacKenzie, Burton T., Jr.; Prober, Maurice; and Kiersztyn, Stanley E., 4,153,752, Cl. 428-379.000.
Mark, Victor, 4,153,595, Cl. 260-45.70S.
McNutt, William J., 4,153,891, Cl. 336-70.000.
Methlie, Jan E., 4,153,141, Cl. 184-6.200.
Schaeffer, Robert L., 4,153,210, Cl. 241-282.100.
Vaughn, Howard A., 4,153,639, Cl. 260-827.000.
General Foods Corporation: *See—*
Berg, Jeffrey H.; and Haas, Gerhard J., 4,153,737, Cl. 426-548.000.
General Motors Corporation: *See—*
Adams, Leon, 4,153,085, Cl. 141-311.00R.
Anderson, Stanley E., 4,153,133, Cl. 180-154.000.
Boyer, James A., 4,153,850, Cl. 307-354.000.
Chana, Howard E., 4,153,147, Cl. 192-3.280.
Ewing, Bruce A.; and Herman, Marvin, 4,152,816, Cl. 29-156.80R.
Fiedler, Kurt H.; and Draisbach, Adolf, 4,153,272, Cl. 280-689.000.
Flora, Raymond A., 4,153,825, Cl. 200-47.000.
Headley, David B., 4,152,953, Cl. 74-569.000.
Laubenstein, Allan E.; Starich, Donald V.; and Brown, Mitchell L., 4,153,019, Cl. 123-117.00R.
Plyler, Robert G.; Seagreaves, George F.; and Suverison, Lyle B., 4,153,319, Cl. 339-75.00P.
Rhamstine, Chester F., 4,153,296, Cl. 297-367.000.
Risko, Richard C., 4,153,273, Cl. 280-740.000.
Rogers, Lloyd W., Jr.; and Klove, Edwin H., Jr., 4,153,274, Cl. 280-745.000.
Speedy, Guido C., 4,153,928, Cl. 362-331.000.
Summers, Jack C.; and Hegedus, Louis, 4,153,579, Cl. 252-462.000.
Thornburgh, William F., 4,153,025, Cl. 123-136.000.
General Signal Corporation: *See—*
Larime, Carl M., 4,153,898, Cl. 340-396.000.
Genevieve I. Hanscom, Robert Magnuson and Lois J. Thompson, as Trustees of the Estate of Roy M. Magnuson: *See—*
Lazzarini, Louis P., 4,152,977, Cl. 99-640.000.
Gensler, Edwin G.: *See—*
White, David B.; Pacitti, William; and Gensler, Edwin G., 4,153,292, Cl. 297-83.000.
Gerber, Arthur M.; and Walworth, Vivian K., to Polaroid Corporation. Method of making silver halide emulsions. 4,153,462, Cl. 96-94.00R.
Gerber, Manfred: *See—*
Becker, Karl-Heinz; Gunther, Friedhelm; Gerber, Manfred; and Roll, Werner, 4,153,216, Cl. 242-56.200.
Gericke, Rolf; Rogalski, Werner; Bergmann, Rolf; Hameister, Walter; and Wahlig, Helmut, to Merck Patent Gesellschaft mit beschrankter Haftung. 1,4-Dihydro-4-oxo-pyridylacetamido cephalosporins and their utilization as medicinal agents for combating bacterial infections. 4,153,693, Cl. 424-246.000.
Gerin, Merlin: *See—*
Mircovich, Jean-Louis; Macaire, Marcel; Charlas, Rene; and Le Floch, Gerard, 4,153,827, Cl. 200-144.00B.

Gerken, Rudolf; Guth, Hans; Mucke, Christoph; Potes, Willi; and Wieschen, Hermann, to Bayer Aktiengesellschaft; and Metallgesellschaft Aktiengesellschaft. Working up spent sulphuric acid simultaneously with sulphate salts. 4,153,628, Cl. 423-531.000.

Germscheid, Hans G.: *See*—
Guinomet, Yves; Tenhaven, Ulrich; Wrede, Wilhelm; Schoenemann, Rudolf; Friedemann, Wolfgang; Groschopp, Heinz; and Germscheid, Hans G., 4,152,916, Cl. 72-42.000.

Gersin, Robert P.; Totaro, Charles S.; Gebhardt, Roland; and Khovaylo, Modest, to Colgate-Palmolive Company. Automatic dispenser-applicator. 4,152,803, Cl. 15-104.940.

Gest, Rene: *See*—
Bichot, Bernard H.; and Gest, Rene, 4,153,498, Cl. 156-446.000.

Geurts, Gerardus A.; and Goettsch, Reijer, to Stamicarbon, B.V. Process for the recovery of ε-caprolactam from a distillation residue containing ε-caprolactam. 4,153,600, Cl. 260-239.30A.

Gewerkschaft Schalker Eisenhutte: *See*—
Gregor, Karl; and Asmus, Kurt, 4,153,515, Cl. 202-241.000.

Ghest, Robert C.; Chua, Hua-Thye; and Birkner, John M., to Monolithic Memories Inc. High speed combinatorial digital multiplier. 4,153,938, Cl. 364-760.000.

Giacin, Terry L. Baby bumpers. 4,153,230, Cl. 248-345.100.

Gill, Stephen H., to Caterpillar Tractor Co. Cross tube construction. 4,153,167, Cl. 214-138.00R.

Gillette Company, The: *See*—
Samsing, Rolf A., 4,153,162, Cl. 206-476.000.

Gillette, Dean, to Bell Telephone Laboratories, Incorporated. Optical crosspoint switch having mode-conversion facilities. 4,153,329, Cl. 350-96.130.

Gilman, Norman; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Pyrazol-1-yl benzodiazepines and oximes thereof. 4,153,799, Cl. 548-378.000.

Girard, Yves: *See*—
Atkinson, Joseph G.; Rooney, Clarence S.; Girard, Yves; and Engelhardt, 4,153,715, Cl. 424-274.000.

Glintz, Georgia E. Bed toiletry and bath basin with throwaway liners. 4,152,792, Cl. 4-175.000.

Glover, Brian: *See*—
Bostock, Susan M.; Boyd, Violet; Fishwick, Brian R.; Glover, Brian; and Korn, Stewart R., 4,153,413, Cl. 8-41.00C.

Gloxhuber, Christian: *See*—
Borggrefe, Gerhard; Moller, Hinrich; Lorenz, Peter; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,153,726, Cl. 424-313.000.

Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V. Process for producing-impact polystyrene. 4,153,647, Cl. 260-880.00R.

Godec, Ciril J.: *See*—
Fravel, Ralph P.; and Godec, Ciril J., 4,153,059, Cl. 128-422.000.

Godfrey, Edmund A., to A. B. Chance Company. Keyhole grounding clamp. 4,153,322, Cl. 339-95.00R.

Goebels, Hermann J., to Robert Bosch GmbH. Wheel lock prevention apparatus. 4,153,307, Cl. 303-119.000.

Goettsch, Reijer: *See*—
Geurts, Gerardus A.; and Goettsch, Reijer, 4,153,600, Cl. 260-239.30A.

Goetzee, Rudolf C.: *See*—
Verloop, Jan; Goetzee, Rudolf C.; and Werner, Erik S. E., 4,153,674, Cl. 423-573.000.

Goetzewerke Friedrich Goetze AG: *See*—
Beyer, Horst; Neuhauser, Hans J.; and Veutgen, Hans-Jurgen, 4,153,477, Cl. 148-1.000.

Gold, Nathan, to Polaroid Corporation. Apparatus and method for electronically improving the apparent resolution of a color imaging CCD. 4,153,912, Cl. 358-44.000.

Gold, Nicholas, to Polaroid Corporation. Film transport for a viewer. 4,153,353, Cl. 353-114.000.

Goldberg, Bruce S.: *See*—
Vecchiotti, Camillo M.; and Goldberg, Bruce S., 4,153,665, Cl. 264-295.000.

Golder Associates, Inc.: *See*—
Kvapil, Rudolph; and Clews, K. Malcolm, 4,153,299, Cl. 299-2.000.
Kvapil, Rudolph; and Clews, K. Malcolm, 4,153,300, Cl. 299-2.000.

Goldstein, Sol. Stress resistant supermarket dispenser for informational sheets. 4,152,851, Cl. 40-10.00R.

Gomer, Bernard. Combined sunglasses and ear pendants. 4,153,346, Cl. 351-52.000.

Gomes, Antonio Z. F. R. P. Portable bidet. 4,152,788, Cl. 4-6.000.

Gonsiorawski, Ronald, to Mobil Tyco Solar Energy Corporation. Manufacture of solar cells. 4,152,824, Cl. 29-572.000.

Goodall Rubber Company: *See*—
Murray, William S., Jr.; and Borden, Clarence W., 4,153,080, Cl. 138-126.000.

Goodin, Dolph L. Cotton cleaning attachment for cotton scraper. 4,152,812, Cl. 19-203.000.

Goodloe, Radford R.: *See*—
United States of America, National Aeronautics and Space Administration; Goodloe, Radford R.; Toole, Pierce C.; Belt, Jerry L.; and Leininger, Donald B., 4,153,818, Cl. 179-27.0CA.

Goodyear Aerospace Corporation: *See*—
Slagel, Edwin C., 4,153,777, Cl. 528-60.000.

Goodyear Tire & Rubber Company, The: *See*—
Bullard, Herbert L.; and Roduner, Larry D., 4,153,771, Cl. 526-221.000.
Burroway, Gary L.; and Maximovich, Michael J., 4,153,592, Cl. 260-29.60N.

Goolsby, Patrick F., to Reynolds Metals Company. Apparatus for solar hot water system and method of making same. 4,153,043, Cl. 126-271.000.

Gorring, Robert L.; and Smith, Robert L., to Mobil Oil Corporation. Upgrading shale oil. 4,153,540, Cl. 208-89.000.

Goto, Kazuo: *See*—
Araki, Kunio; Sasaki, Takashi; Tabei, Kiyoshi; and Goto, Kazuo, 4,153,525, Cl. 204-159.150.

Goudie, Alexander C., to Beecham Group Limited. Anti-inflammatory compounds. 4,153,718, Cl. 424-275.000.

Gould Inc.: *See*—
Kozacka, Frederick J., 4,153,892, Cl. 337-159.000.
Sidman, Michael D., 4,153,870, Cl. 323-18.000.

Gouley, Gilbert M., to Agence Nationale de Valorisation de la Recherche. Automatic transfer apparatus. 4,153,240, Cl. 270-68.00R.

Gradeff, Peter S.; and Angeles, Marshall R., to Rhodia, Inc. Process for preparing methyl heptenone by reaction of prenyl-substituted methyl pentenones with a poly-functional amine. 4,153,633, Cl. 260-593.00R.

Graefje, Heinz; Nottes, Guenther; Mueller, Herbert; Daumiller, Guenther; and Hoffmann, Herwig, to BASF Aktiengesellschaft. ω-Disubstituted amino alkanoic acid-N-amides as fuel additives. 4,153,425, Cl. 44-71.000.

Graf, Robert G. Ground monitoring system and method. 4,153,923, Cl. 361-48.000.

Graham, David E.: *See*—
Schneider, Louis; and Graham, David E., 4,153,446, Cl. 71-95.000.

Grahme, Robert E., Jr.: *See*—
Harrison, William A.; Hubbard, Winchester L.; Grahme, Robert E., Jr.; and Tousignant, James N., 4,153,703, Cl. 424-270.000.

Grandle, James A., Jr., to Bell Telephone Laboratories, Incorporated. Method and arrangement for buffering data. 4,153,944, Cl. 364-900.000.

Granier, William: *See*—
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, 4,153,478, Cl. 148-6.15R.

Graser, Earl J.; and Wilson, Jerry F., to Olinkraft, Inc. Twelve-article basket carrier. 4,153,158, Cl. 206-173.000.

Grauleau, Didier; Mourier, Jean; Shroff, Arvind; and Villain, Jacques, to Thomson-Brandt; and Compagnie des Lampes. Solar energy collector. 4,153,041, Cl. 126-271.000.

Green, David T., to United States Surgical Corporation. System for applying surgical clips. 4,152,920, Cl. 72-410.000.

Green, Leonard O. Wall repair clip. 4,152,877, Cl. 52-514.000.

Green, Wendel C.; Cunningham, Russell E.; Light, Gordon S.; Sharkitt, Patrick J.; and Webster, Charles W., to Sigma Systems Inc. Automatic library control apparatus. 4,153,931, Cl. 364-200.000.

Greenewald, Herbert, Jr. Vapor nucleation method. 4,153,449, Cl. 75-11.000.

Greenewald, Herbert, Jr. Manufacture of carbides and the like. 4,153,527, Cl. 204-164.000.

Greenwood, Mark E., to Owens-Corning Fiberglas Corporation. Noncorrosive hold down lug for tanks. 4,153,177, Cl. 220-85.00R.

Gregor, Karl; and Asmus, Kurt, to Gewerkschaft Schalker Eisenhutte. Discharge apparatus for coke-oven battery. 4,153,515, Cl. 202-241.000.

Gregory, Vernon C., to Motorola, Inc. Industrial control processor. 4,153,942, Cl. 364-900.000.

Greive, Don A.: *See*—
Lewis, Mack A.; and Greive, Don A., 4,153,289, Cl. 296-24.00C.

Grier, William R.; Shepard, Francis H., Jr.; and Arledge, Arthur L., to Realty & Industrial Corporation. Electronic typographic apparatus. 4,153,940, Cl. 340-711.000.

Griffin, Thomas J., Jr., to Dow Chemical Company, The. Method of reducing friction loss. 4,153,066, Cl. 137-13.000.

Griffin, Thomas J., Jr., to Dow Chemical Company, The. Phosphate ester-type reaction product and method of preparing same. 4,153,649, Cl. 260-950.000.

Grimm, Richard C.: *See*—
Reed, Denvil E.; and Grimm, Richard C., 4,153,516, Cl. 203-64.000.

Grindheim, Earl A., to Rosemount Inc. Transducer for converting a varying analog current signal to a binary digital signal. 4,153,873, Cl. 324-60.00R.

Grisar, Johann M.; Blohm, Thomas R.; and Roberts, Edward M., to Richardson-Merrell Inc. Substituted cycloalkyl lactamimides. 4,153,235, Cl. 260-239.00B.

Groschopp, Heinz: *See*—
Guinomet, Yves; Tenhaven, Ulrich; Wrede, Wilhelm; Schoenemann, Rudolf; Friedemann, Wolfgang; Groschopp, Heinz; and Germscheid, Hans G., 4,152,916, Cl. 72-42.000.

Gross, Franz, to Siemens Aktiengesellschaft. Travelling wave tube with a helical delay line. 4,153,859, Cl. 315-3.500.

Grow Chemical Corp.: *See*—
Williams, Charles E., 4,153,642, Cl. 260-837.00R.

Gruber, Gerald W.: *See*—
Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, 4,153,776, Cl. 528-49.000.

Grundy & Partners Limited: *See*—
Jones, Keith D.; Cowap, Geoffrey R.; and Bradshaw, Mark R., 4,153,935, Cl. 364-461.000.

Grupo Industrial Alfa, S.A.: *See*—
MacKay, Patrick W.; Vera, Enrique M.; and de la Pena, Ramon, 4,153,450, Cl. 75-26.000.
GTE Sylvania Incorporated: *See*—
Arumugham, Rangaswamy; and Kam, George H., 4,153,914, Cl. 358-195.000.
English, George J.; and Fohl, Timothy, 4,153,365, Cl. 355-99.000.
Wolfe, Robert W., 4,153,572, Cl. 252-301.40R.
Gugeler, William G. Animated visual effect adaptor for projectors. 4,153,354, Cl. 353-122.000.
Guha, Dwipendra N., to Avnet, Inc. Tangential tracking tonearm. 4,153,256, Cl. 274-23.00A.
Guinomet, Yves; Tenhaven, Ulrich; Wrede, Wilhelm; Schoenemann, Rudolf; Friedemann, Wolfgang; Groschopp, Heinz; and Germscheid, Hans G., to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Method of processing steel strip using a roiling oil emulsion containing SiO_2 as a stabilized silicic acid sol. 4,152,916, Cl. 72-42.000.
Guithues, William L.; and Legal, Casimer C., Jr., to W. R. Grace & Co. Process for making magnesium potassium ammonium phosphate. 4,153,441, Cl. 71-34.000.
Gulf Research & Development Company: *See*—
Bercik, Paul G.; Swift, Harold E.; and Metzger, Kirk J., 4,153,638, Cl. 585-526.000.
Schulz, Johann G. D.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,153,785, Cl. 528-347.000.
Wu, Ching-Yong; Swift, Harold E.; and Bozik, John E., 4,153,635, Cl. 568-574.000.
Gunther, Friedhelm: *See*—
Becker, Karl-Heinz; Gunther, Friedhelm; Gerber, Manfred; and Roll, Werner, 4,153,216, Cl. 242-56.200.
Gupta, Omkarath R.: *See*—
Antonetti, Vincent W.; and Gupta, Omkarath R., 4,153,107, Cl. 165-185.000.
Guth, Hans: *See*—
Gerken, Rudolf; Guth, Hans; Mucke, Christoph; Potes, Willi; and Wieschen, Hermann, 4,153,628, Cl. 423-531.000.
Guyen, Xiem, to Robert Bosch GmbH. High-power zoom projection objective. 4,153,337, Cl. 350-184.000.
Haack, Christian H.: *See*—
Weissman, Richard; Haack, Christian H.; and Fried, Michael W., 4,153,011, Cl. 119-72.000.
Haack, Dieter: *See*—
Lauterberg, Werner; Steinmetzer, Herbert; Weber, Brigitte; Haack, Dieter; and Taube, Werner, 4,153,762, Cl. 521-53.000.
Haarmann & Reimer GmbH: *See*—
Neumann, Rainer; Schwarz, Hans-Helmut; and Arnold, Karl-Heinz, 4,153,810, Cl. 568-630.000.
Haas, Davey S.; and Helton, Claude D., to United States of America, Navy. Electric match with epoxy coated fluorocarbon containing pyrotechnic composition. 4,152,988, Cl. 102-28.00M.
Haas, Gerhard J.: *See*—
Berg, Jeffrey H.; and Haas, Gerhard J., 4,153,737, Cl. 426-548.000.
Haas, Hans: *See*—
Diem, Hans; Aicher, Albrecht; Haas, Hans; Dudeck, Christian; and Finkbeiner, Fritz, 4,153,410, Cl. 431-5.000.
Haas, Rudy M. Chemical tracer method of and structure for determination of instantaneous and total mass and volume fluid flow. 4,153,418, Cl. 23-232.00R.
Habermann, Clarence E., to Dow Chemical Company, The. Method of producing amines from alcohols, aldehydes, ketones and mixtures thereof. 4,153,581, Cl. 252-472.000.
Habisohn, Victor J. Device for forming bubbles from planar film shapes. 4,152,864, Cl. 46-6.000.
Hacker, Ronald. Apparatus for use in disassembling an automobile transmission. 4,153,130, Cl. 180-70.00R.
Hackler, Ronald E.: *See*—
Balko, Terry W.; and Hackler, Ronald E., 4,153,701, Cl. 424-263.000.
Hadley, Chris L.: *See*—
Schmitz, William D.; Turpin, Richard H.; Dashiell, Robert A.; and Hadley, Chris L., 4,153,936, Cl. 364-493.000.
Haefner, Albert J.; and Kucsma, Michael E., to Ethyl Corporation. Crushing process for recyclable plastic containers. 4,153,206, Cl. 241-14.000.
Hafner, Leroy A.: *See*—
Beiter, Charles B.; and Hafner, Leroy A., 4,153,574, Cl. 252-316.000.
Hagen, Alexander: *See*—
Edelmann, Hermann; Kraft, Peter; Mann, Karlheinz; Schuler, Peter; and Hagen, Alexander, 4,153,513, Cl. 195-103.50R.
Hagler, Gerald E.: *See*—
Capps, Spencer W.; Hagler, Gerald E.; and Abhiraman, Agaram S., 4,153,409, Cl. 425-72.00S.
Haida, Osamu: *See*—
Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, 4,153,454, Cl. 75-124.000.
Halcon Research and Development Corp.: *See*—
Peltzman, Alan, 4,153,806, Cl. 560-246.000.
Hall, A. Douglass. Coin bank. 4,153,197, Cl. 232-5.000.
Hall, John B.: *See*—
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Hall, Patrick; and Walker, Peter F., to Smiths Industries Limited. Fluid pressure supply apparatus. 4,152,970, Cl. 91-318.000.
Hall, Stanley R.; and Benavides, Armando, to Bunker Ramo Corporation. Circuit for normalizing devices having current-controlled frequency response to predetermined I-F characteristic. 4,153,849, Cl. 307-295.000.
Hallgren, Henning R.; and Wide, Leif E., to Pharmacia Diagnostics AB. Method of indicating rheumatoid factors. 4,153,417, Cl. 23-230.00B.
Halm Instrument Co., Inc.: *See*—
Harrison, Henry; and Harrison, Henry C., 4,153,040, Cl. 126-271.000.
Halm, James M., to A. B. Dick Company. Vinyl polymerization with boron chelates as catalyst and photoconductive sensitizer. 4,153,769, Cl. 526-195.000.
Hama, Hiroyuki, to Olympus Optical Co., Ltd. Light source apparatus for endoscope. 4,153,356, Cl. 354-62.000.
Hamada, Hiroshi; Nakauchi, Hiroshi; Hishida, Tadanori; and Yano, Kozo, to Sharp Kabushiki Kaisha. Lead-in electrode structure for electrochromic displays of the segmented type. 4,153,344, Cl. 350-357.000.
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Hameister, Walter: *See*—
Gericke, Rolf; Rogalski, Werner; Bergmann, Rolf; Hameister, Walter; and Wahlig, Helmut, 4,153,693, Cl. 424-246.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler. 4,153,217, Cl. 242-71.800.
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Hammar, Walton J.; and Rustad, Mark A., to Riker Laboratories, Inc. Derivatives of 2-nitrobenzofuran. 4,153,721, Cl. 424-285.000.
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Scherrer, Robert A.; Hammar, Walton J.; and Stern, Richard M., 4,153,716, Cl. 424-274.000.
Hammel, Harold T.; and Maggert, James E., to University of California, The Regents of the. Method and apparatus for separating solvent from solute. 4,153,546, Cl. 210-41.000.
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Hananoi, Toshihiro: *See*—
Yasuda, Michio; Nakano, Yasuaki; Fujisawa, Hiromichi; and Hananoi, Toshihiro, 4,153,897, Cl. 340-146.30Q.
Hancock, Roger I., to Imperial Chemical Industries Limited. Stabilized anionic surfactants. 4,153,583, Cl. 252-550.000.
Hansen, Nils B. Fishing lure retriever. 4,152,859, Cl. 43-17.200.
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Holmes, Dale E.; Konkle, Donald W.; Warner, C. James; and Hansen, Richard L., 4,153,248, Cl. 273-58.00A.
Hanson, Maurice J. Telephone lock. 4,153,823, Cl. 179-189.00R.
Harada, Yuho; Hiramatu, Kenzo; Hasegawa, Katsuhito; and Ishibashi, Kuniaki, to Fuji Photo Optical Co., Ltd. Optical fiber bundle with field stop. 4,153,333, Cl. 350-96.250.
Harris Corporation: *See*—
Taylor, David L.; and Harris, Stephen A., 4,153,883, Cl. 330-262.000.
Harris, James J.: *See*—
Kersting, R. James; and Harris, James J., 4,153,171, Cl. 215-12.00R.
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Harrison, Henry; and Harrison, Henry C., to Halm Instrument Co., Inc. Protective cooling system for solar heat collector. 4,153,040, Cl. 126-271.000.
Harrison, Henry C.: *See*—
Harrison, Henry; and Harrison, Henry C., 4,153,040, Cl. 126-271.000.
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Hart, Anthony C.; and Wearmouth, William R., to International Nickel Company, Inc., The. Composite electrodeposits and alloys. 4,153,453, Cl. 75-123.00J.
Hart, John A., to Canada, Her Majesty the Queen in right of. Sweat resistant gas protective material. 4,153,745, Cl. 427-244.000.
Hart, Michael L. Method of and apparatus for perforating boreholes. 4,153,118, Cl. 175-4.510.
Hartley, Ezra D., to Carr-Griff, Inc. Triple discharge pump. 4,153,391, Cl. 417-269.000.
Hartman, Gary R. Soil penetration emitter for drip irrigation systems. 4,153,380, Cl. 405-39.000.

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Hockswender, Thomas R.; and Hartman, Marvis E., 4,153,586, Cl. 260-18.0EP.
Hartmann, Ludwig A., to ICI Americas Inc. Glycidyl ethers derived from 3,3',5,5'-tetraalkyl-4,4'-dihydroxybiphenyl. 4,153,621, Cl. 260-348.640.
Haruna, Takayuki: *See*—
Tanaka, Teruaki; and Haruna, Takayuki, 4,152,918, Cl. 72-238.000.
Hascon (U.K.) Limited: *See*—
Haskins, Richard H., 4,153,304, Cl. 406-28.000.
Hasegawa, Katsuhito: *See*—
Harada, Yuho; Hiramatu, Kenzo; Hasegawa, Katsuhito; and Ishibashi, Kuniaki, 4,153,333, Cl. 350-96.250.
Haselmann, Heinrich: *See*—
Barenyi, Bela; Haselmann, Heinrich; and Rieth, Egon, 4,153,290, Cl. 296-191.000.
Hasha, Malvern M. Method and apparatus for testing the connections between pipe segments. 4,152,926, Cl. 73-46.000.
Hashimoto, Makoto; Tomita, Yoshio; Nagatsuna, Fumio; Hirose, Masateru; and Tanno, Shogo, to Dainichi-Nippon Cables, Ltd. Method and apparatus for separating wires. 4,153,179, Cl. 221-1.000.
Hashimoto, Teiji: *See*—
Kodaira, Noboru; Tezuka, Nobuo; Senuma, Mitio; Hashimoto, Teiji; Uchidoi, Masanori; and Iura, Yukio, 4,153,360, Cl. 354-241.000.
Haskins, Richard H., to Hascon (U.K.) Limited. Apparatus for transporting flowable particulate material. 4,153,304, Cl. 406-28.000.
Haslam, Beverly J. Convertible handbag. 4,153,092, Cl. 150-33.000.
Hattori, Kyo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Idling fuel supplying system of a carburetor. 4,153,650, Cl. 261-41.00D.
Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, to Nippon Soken, Inc. Air-fuel mixture ratio correcting system for carburetor. 4,153,021, Cl. 123-119.0EC.
Hausberger, Arthur L.; and Dienes, Edward K., to United Catalysts Inc. CO conversion catalyst. 4,153,580, Cl. 252-462.000.
Hausknecht, Louis A. Valve control system. 4,153,016, Cl. 123-90.150.
Hawley, Royal T., to Western Gear Corporation. Shock absorbing apparatus for hoisting underwater pipeline. 4,153,381, Cl. 405-173.000.
Hayakawa, Akifumi; Aiba, Akira; Orihara, Eiki; and Fukushima, Kiyoshi, to Nippon Steel Chemical Co., Ltd. Mould assembly for foam moulding of plastic materials. 4,153,231, Cl. 249-82.000.
Hayamizu, Yoshisada, to Olympus Optical Co., Ltd. Pattern projector for automatic focusing endoscope. 4,153,834, Cl. 250-201.000.
Hayashi, Kenji: *See*—
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Haybuster Mfg. Inc.: *See*—
Morlock, Reuben D., 4,153,114, Cl. 171-65.000.
Hayes, Larry J.: *See*—
Recktenwald, Gerald W.; and Hayes, Larry J., 4,153,659, Cl. 264-83.000.
Headley, David B., to General Motors Corporation. Roller cam follower with anti-rotation device. 4,152,953, Cl. 74-569.000.
Heath, Frederick G., to VBM Corporation. Shower stall enclosure. 4,152,789, Cl. 4-146.000.
Heckler & Koch GmbH: *See*—
Ketterer, Dieter, 4,152,857, Cl. 42-88.000.
Hegedus, Louis: *See*—
Summers, Jack C.; and Hegedus, Louis, 4,153,579, Cl. 252-462.000.
Heimann GmbH: *See*—
Meyer, Juergen, 4,153,908, Cl. 357-32.000.
Heimberger, Helmut, to Optilon W. Erich Heilmann GmbH. Slide fastener with separable end members. 4,152,813, Cl. 24-205.11F.
Heintke, Hans E.; Karey, Hans; and Oberheim, Robe.., to Braun Aktiengesellschaft. Coupling arrangement for camera and flash unit. 4,153,359, Cl. 354-126.000.
Heise, Hartmut; Leibmann, Bernd; Morler, Dieter; Ritter, Eberhard; and Sahm, Wilfried, to Hoechst Aktiengesellschaft. Process for the manufacture of 5-acetoacetylamino-benzimidazolone. 4,153,798, Cl. 548-305.000.
Heitmeyer, Ulrich; Kupsa, Adrian; and Forster, Hans-Joachim, to Daimler-Benz Aktiengesellschaft. Drive aggregate for electric vehicles. 4,153,128, Cl. 180-65.00E.
Hellmund, Wolfgang; Krug, Gerhard; Missaire, Gerhard; Roether, Kurt; and Schatton, Paul, to Mannesmann Aktiengesellschaft. Casing joint. 4,153,283, Cl. 285-334.000.
Helton, Claude D.: *See*—
Haas, Davey S.; and Helton, Claude D., 4,152,988, Cl. 102-28.00M.
Hems, Roger: *See*—
Rowsell, David G.; Spring, David J.; and Hems, Roger, 4,153,679, Cl. 424-45.000.
Henderson, Chuck A. Floating air erecting painting punt. 4,153,000, Cl. 114-222.000.
Hendrischk, Wolfgang, to Mannesmann Aktiengesellschaft. Cutting of paper in a printer. 4,152,962, Cl. 83-482.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Borggrefe, Gerhard; Moller, Hinrich; Lorenz, Peter; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,153,726, Cl. 424-313.000.
Guinomet, Yves; Tenhaven, Ulrich; Wrede, Wilhelm; Schoenemann, Rudolf; Friedemann, Wolfgang; Groschopp, Heinz; and Germscheid, Hans G., 4,152,916, Cl. 72-42.000.
Hennemann, Manfred; Lohr, Albrecht; and Krings, Peter, 4,153,570, Cl. 252-121.000.
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Heraud, Jean P.: *See*—
Delbende, Pierre; and Heraud, Jean P., 4,153,627, Cl. 260-505.00P.
Hercules Incorporated: *See*—
Cox, Paul R., Jr., 4,152,885, Cl. 57-207.000.
Herman, Marvin: *See*—
Ewing, Bruce A.; and Herman, Marvin, 4,152,816, Cl. 29-156.80R.
Herman Miller, Inc.: *See*—
Propst, Robert L., 4,153,313, Cl. 312-211.000.
Herrick, Carlyle S., to General Electric Company. Thermal energy storage and release utilizing combined sensible heat and latent heat of fusion. 4,152,899, Cl. 62-4.000.
Herrington, Daniel R.; and Schwerko, Albert P., to Standard Oil Company, The. Process for preparing improved amphora aggregates. 4,153,539, Cl. 208-216.00R.
Herzog, Michael. Pre-gummed tea bag tag assembly. 4,153,153, Cl. 206-0.500.
Hester, Jarrett C., to Clemson University. Absorption heating-cooling system. 4,152,904, Cl. 62-476.000.
Heumann, Oskar: *See*—
Raaf, Helmut; and Heumann, Oskar, 4,152,806, Cl. 15-169.000.
Hewlett-Packard Company: *See*—
Gatzke, Ronald D.; Larsen, James L.; and Simons, Elliott S., 4,153,049, Cl. 128-419.00D.
Hibino, Toshihiko; and Murayama, Eiichi, to Sumitomo Chemical Company, Limited. Process for producing 5-carboxy-2-acetylthiophene. 4,153,610, Cl. 260-332.20C.
Hider, Ross B.; and Hider, Ross J. Three dimensional solar panel assembly. 4,153,475, Cl. 136-89.0PC.
Hider, Ross J.: *See*—
Hider, Ross B.; and Hider, Ross J., 4,153,475, Cl. 136-89.0PC.
Higgins, John T., to Cominco Ltd. Process and apparatus for cleaning prilling tower effluent. 4,153,431, Cl. 55-85.000.
High Point, Incorporated: *See*—
Farmer, William C., 4,153,456, Cl. 96-27.00R.
Hilber, Johann, to Kreidler Werke GmbH. Wheels for land vehicles such as motorcycles. 4,153,267, Cl. 280-281.00R.
Hill, David T.: *See*—
Bender, Paul E.; and Hill, David T., 4,153,706, Cl. 424-270.000.
Hill, Doyle E.; and Sanford, Karl J., to Eastman Kodak Company. Multi-zone analytical element and method using same. 4,153,668, Cl. 422-56.000.
Hill, Forrest G., to Marsh Stencil Machine Co., The. Plastic, heated water container for tape machines. 4,153,046, Cl. 126-390.000.
Hill, P. Larry: *See*—
Black, Brent C.; and Hill, P. Larry, 4,153,071, Cl. 137-386.000.
Hiller, William E.: *See*—
Tasch, Al F., Jr.; Fu, Horng-Sen; Chatterjee, Pallab K.; and Hiller, William E., 4,153,904, Cl. 357-13.000.
Hillyar-Russ, Geoffrey, to Coal Industry (Patents) Limited. Method of agitating slurries. 4,153,375, Cl. 366-275.000.
Hilti Aktiengesellschaft: *See*—
Jochum, Peter, 4,153,192, Cl. 227-10.000.
Hine, Louis P., Jr.: *See*—
Loving, Roderick L.; and Hine, Louis P., Jr., 4,153,310, Cl. 312-100.000.
Hintze, Rudolf. Compressor for air-conditioning devices for vehicles. 4,152,956, Cl. 74-603.000.
Hirai, Shin-Ichiro; Ikenaga, Toshiaki; and Matsuzawa, Tai, to Takeda Chemical Industries, Ltd. Stable insulin preparation for nasal administration. 4,153,689, Cl. 424-178.000.
Hiramatu, Kenzo: *See*—
Harada, Yuho; Hiramatu, Kenzo; Hasegawa, Katsuhito; and Ishibashi, Kuniaki, 4,153,333, Cl. 350-96.250.
Hirohata, Michio: *See*—
Ikawa, Kazuo; Hirohata, Michio; Matsuda, Mutsuhide; and Mashimo, Yukio, 4,153,355, Cl. 354-33.000.
Hirose, Masateru: *See*—
Hashimoto, Makoto; Tomita, Yoshio; Nagatsuna, Fumio; Hirose, Masateru; and Tanno, Shogo, 4,153,179, Cl. 221-1.000.
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, to Idemitsu Kosan Company Limited. Process for the production of novel polysaccharide. 4,153,508, Cl. 195-31.00P.
Hishida, Tadanori: *See*—
Hamada, Hiroshi; Nakauchi, Hiroshi; Hishida, Tadanori; and Yano, Kozo, 4,153,344, Cl. 350-357.000.
Hitachi, Ltd.: *See*—
Azuma, Nobuo; Abe, Yuuhei; Mohri, Katsuo; and Yabe, Yuhiko, 4,153,922, Cl. 361-3.000.
Eki, Yurio; Tennichi, Yasuhiro; and Honda, Naganobu, 4,153,198, Cl. 235-303.300.
Itoh, Seiichi; and Suzuki, Kensuke, 4,153,910, Cl. 357-68.000.
Kato, Yasuo; Komoda, Tsutomu; and Tomura, Teruichi, 4,153,334, Cl. 350-132.000.
Kawamura, Yoshio; and Moriyama, Shigeo, 4,153,341, Cl. 350-255.000.
Koizumi, Mituyoshi; Akiyama, Nobuyuki; and Kuni, Asahiro, 4,153,371, Cl. 356-400.000.
Maki, Hideo; Hosokawa, Takanori; and Shinbo, Katsutoshi, 4,153,506, Cl. 176-20.00R.
Nagano, Masami; and Suzuki, Satosi, 4,153,026, Cl. 123-139.0AW.
Suzuki, Yoshihiro; Minakawa, Tadashi; and Asai, Osamu, 4,153,519, Cl. 204-40.000.

Yasuda, Michio; Nakano, Yasuaki; Fujisawa, Hiromichi; and Hananoi, Toshihiro, 4,153,897, Cl. 340-146.30Q.
Hockswender, Thomas R.; and Hartman, Marvis E., to PPG Industries, Inc. Process of making epoxy resins modified with mercaptocarboxylates. 4,153,586, Cl. 260-18.0EP.
Hoechst Aktiengesellschaft: *See*—
Albert, Walter; Dicks, Manfred; and Schiedrum, Hans O., 4,153,408, Cl. 425-532.000.
Berghauser, Gunter; and Uhlig, Fritz, 4,153,461, Cl. 96-75.000.
Dinter, Peter; and Kolbe, Andreas, 4,153,560, Cl. 250-531.000.
Heise, Hartmut; Leibmann, Bernd; Morler, Dieter; Ritter, Eberhard; and Sahm, Wilfried, 4,153,798, Cl. 548-305.000.
Hornke, Ingolf; Fehlhaber, Hans-Wolfram; and Uihlein, Michael, 4,153,697, Cl. 424-258.000.
Humuller, Edwin; Keil, Karl-Heinz; and Ribka, Joachim, 4,153,561, Cl. 252-8.750.
Schiessler, Siegfried; Spietschka, Ernst; and Zunker, Reinhard, 4,153,602, Cl. 546-37.000.
Stahl, Dieter; and Puchel, Ernst, 4,153,470, Cl. 106-116.000.
Hoehn, Hans, to E. R. Squibb & Sons, Inc. Hydrazino derivatives of 1H-pyrazolo(3,4-b)-pyridine-5-carboxamides. 4,153,796, Cl. 546-120.000.
Hoerdt, Heinrich G.: *See*—
Boettcher, Klaus; Hoerdt, Heinrich G.; Zacher, Wieland; and Buechner, Oskar, 4,153,774, Cl. 526-352.200.
Hoesch Werke Aktiengesellschaft: *See*—
Becker, Karl-Heinz; Gunther, Friedhelm; Gerber, Manfred; and Roll, Werner, 4,153,216, Cl. 242-56.200.
Hoff, Stephen J., to Hoffco, Inc. Lawn mower blade rotation warning device. 4,152,881, Cl. 56-11.300.
Hoffco, Inc.: *See*—
Hoff, Stephen J., 4,152,881, Cl. 56-11.300.
Hoffmann, Herwig: *See*—
Graefje, Heinz; Nottes, Guenther; Mueller, Herbert; Daumiller, Guenther; and Hoffmann, Herwig, 4,153,425, Cl. 44-71.000.
Hoffmann-La Roche Inc.: *See*—
Barner, Richard; and Schmid, Max, 4,153,614, Cl. 260-340.90R.
Gilman, Norman; and Fryer, Rodney I., 4,153,799, Cl. 548-378.000.
Rosenberger, Michael, 4,153,805, Cl. 560-240.000.
Saucy, Gabriel, 4,153,615, Cl. 260-340.90R.
Hofmann, Heinrich: *See*—
Markfelder, Gunter; and Hofmann, Heinrich, 4,153,309, Cl. 308-217.000.
Hofmeister, Lucien; and Schulte, Harvey L., to Kasper Instruments, Inc. Carrier for semiconductive wafers. 4,153,164, Cl. 211-41.000.
Hohmann, Walter; and Schutze, Detlef-Ingo, to Bayer Aktiengesellschaft. Anthraquinone vat dyestuffs. 4,153,608, Cl. 260-316.000.
Hokushin Electric Works, Ltd.: *See*—
Yoshida, Takeshi, 4,153,068, Cl. 137-84.000.
Holmes, Dale E.; Konkle, Donald W.; Warner, C. James; and Hansen, Richard L. Ball. 4,153,248, Cl. 273-58.00A.
Holmes, Robert E.; and Zimmerman, Robert R., to Tektronix, Inc. Method of making a metalized substrate having a thin film barrier layer. 4,153,518, Cl. 204-38.00B.
Holst, Wayne L.: *See*—
Fathauer, George H.; and Holst, Wayne L., 4,153,877, Cl. 325-25.000.
Holzl, Robert A., to Chemetal Corporation. Deposition method and products. 4,153,483, Cl. 148-31.500.
Honda Giken Kogyo Kabushiki Daisha: *See*—
Sakata, Mamoru; Yoshioka, Hiroshi; and Ohashi, Masahiro, 4,153,131, Cl. 180-43.00R.
Honda, Naganobu: *See*—
Eki, Yurio; Tennichi, Yasuhiro; and Honda, Naganobu, 4,153,198, Cl. 235-303.300.
Honeywell Inc.: *See*—
Anderson, George A., 4,153,943, Cl. 364-900.000.
Hoover, John: *See*—
Ellmer, David, 4,153,199, Cl. 236-9.00A.
Hopkins, John W.; and Sellars, Claude A., to Lockheed Petroleum Services, Ltd. Subsea drill-thru manifold center. 4,153,113, Cl. 166-356.000.
Hori, Mitsutaka. Bar screen. 4,153,557, Cl. 210-396.000.
Horlein, Ulrich; Boshagen, Horst; and Seuter, Friedel, to Bayer Aktiengesellschaft. Basically alkylated dithiosalicyclic acid amides and their use as medicaments. 4,153,702, Cl. 424-267.000.
Horn, Marcus J.: *See*—
Bonner, Alex G.; and Horn, Marcus J., 4,153,416, Cl. 23-230.00A.
Horn, Peter; Leppmeier, Franz; Eckert, Guenter; and Fischer, Karl, to BASF Aktiengesellschaft. Nylon copolymer from piperazine, aliphatic diamine and mixture of aliphatic diacids. 4,153,784, Cl. 528-338.000.
Hornke, Ingolf; Fehlhaber, Hans-Wolfram; and Uihlein, Michael, to Hoechst Aktiengesellschaft. 8-Amino-2-methyl-4-phenyl-1,2,3,4-tetrahydroisoquinoline-8-N-glucuronide pharmaceutical preparations and method of use. 4,153,697, Cl. 424-258.000.
Horst Zerhoch Vorrichtungs und maschinenbau GmbH & Co. KG: *See*—
Zerhoch, Horst; and Vohringer, Karl, 4,152,913, Cl. 72-20.000.
Hort, Eugene V.: *See*—
De Thomas, Waldo R.; and Hort, Eugene V., 4,153,578, Cl. 252-438.000.
Horvath, Jeno: *See*—
Domok, Istvan; Kocsis, Oliver; Banszki, Miklos; and Horvath, Jeno, 4,152,829, Cl. 30-139.000.
Hosaka, Akio: *See*—
Asano, Masaharu; and Hosaka, Akio, 4,153,023, Cl. 123-119.0EC.
Hosokawa, Takanori: *See*—
Maki, Hideo; Hosokawa, Takanori; and Shinbo, Katsutoshi, 4,153,506, Cl. 176-20.00R.
Houch, Melvin J. Non adjustable climber. 4,153,139, Cl. 182-221.000.
Hounsfield, Godfrey N.; and Chan, Tai Y., to EMI Limited. Radiography. 4,153,839, Cl. 250-366.000.
Housel, Richard W.: *See*—
Patton, James S.; and Housel, Richard W., 4,153,146, Cl. 190-44.000.
Houtkamp, Johannes J., to N.V. Optische Industrie "De Oude Delft". Method of sealing an image intensifier tube, and an image intensifier tube thus produced. 4,153,316, Cl. 316-19.000.
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Howard, Tyson W. Vegetation cutting assembly. 4,152,882, Cl. 56-13.700.
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O'Neill, Peter A., 4,153,395, Cl. 418-9.000.
Howell, Stephen L., to Kimball International, Inc. Organ circuit and method of operation. 4,152,965, Cl. 84-1.030.
Hruza, Denis E., Sr.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,811, Cl. 568-820.000.
Hsieh, Chuan-Kang R.: *See*—
Vasalos, Iacovos A.; Ford, William D.; and Hsieh, Chuan-Kang R., 4,153,535, Cl. 208-120.000.
Hsueh, Samuel B.: *See*—
Delserro, Samuel; and Hsueh, Samuel B., 4,153,228, Cl. 248-74.0PB.
Huard, Bertrand: *See*—
Wildi, Theodore; and Huard, Bertrand, 4,153,323, Cl. 339-95.00R.
Hubbard, Winchester L.: *See*—
Harrison, William A.; Hubbard, Winchester L.; Grahme, Robert E., Jr.; and Tousignant, James N., 4,153,703, Cl. 424-270.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Pyrazolylacetanilide compounds and fungicidal compositions. 4,153,712, Cl. 424-273.00P.
Huber, Reinhold: *See*—
Koster, Waldemar; and Huber, Reinhold, 4,152,799, Cl. 14-16.100.
Huber, Theodor: *See*—
Borowski, Kurt; Stumpf, Friedrich; and Huber, Theodor, 4,153,352, Cl. 352-91.00C.
Huber, Wolfgang; and Marx, Anton, to SKF Industrial Trading and Development Company. Packing seal. 4,153,258, Cl. 277-56.000.
Hubert, Peter: *See*—
Roselius, Wilhelm; Vitzthum, Otto; and Hubert, Peter, 4,153,063, Cl. 131-143.000.
Huchette, Michel; and Bussiere, Guy, to Roquette Freres. Dry coloring material from by-food product of starch manufacture. 4,153,734, Cl. 426-250.000.
Hughes Aircraft Company: *See*—
Little, Michael J.; Garvin, Hugh L.; and Lee, Yat-Shir, 4,153,529, Cl. 204-192.0EC.
Hughes, Allan F. Carrier for clothes hangers. 4,153,189, Cl. 224-45.00T.
Hughes, Lise A.: *See*—
Kubela, Rudolf; Musil, Vaclav; and Hughes, Lise A., 4,153,789, Cl. 544-143.000.
Huisman, Hendrikus, to U.S. Philips Corporation. Magnetic recording medium in which an N-acylsarcosine derivative is used as a dispersing agent. 4,153,754, Cl. 428-539.000.
Hultsch, Gunther; and Wilkesmann, Helmut, to Krauss-Maffei AG. Wobble centrifuge and method of operation. 4,153,551, Cl. 210-78.000.
Humuller, Edwin; Keil, Karl-Heinz; and Ribka, Joachim, to Hoechst Aktiengesellschaft. Conditioning agent. 4,153,561, Cl. 252-8.750.
Hund, Franz; and Kresse, Peter, to Bayer Aktiengesellschaft. $CaZn_2(PO_4)_2 \cdot 2H_2O$ anticorrosion pigment. 4,153,465, Cl. 106-14.250.
Hung, Ling K.: *See*—
Bloom, Allen; and Hung, Ling K., 4,153,343, Cl. 350-349.000.
Hung, Wendell L. Y.: *See*—
Csathy, Denis G.; Hung, Wendell L. Y.; and Pehoski, Charles J., 4,153,012, Cl. 122-7.00R.
Huntington Alloys, Inc.: *See*—
Eiselstein, Herbert L.; and Lingenfelter, Allen C., 4,153,455, Cl. 75-171.000.
Hurley, Bernard: *See*—
Alphonse, Gerard A.; Vilkomerson, David H. R.; and Hurley, Bernard, 4,153,894, Cl. 340-1.00R.
Hurt, Jackson D. Cyclic illumination device. 4,153,926, Cl. 362-35.000.
Hutchins, Burleigh M.: *See*—
McNeil, Roderick J.; and Hutchins, Burleigh M., 4,153,076, Cl. 137-624.110.
Hutchinson, William Y.; and Kushmuk, Walter P., to Continental Scale Corporation. Digital electronic scale. 4,153,125, Cl. 177-211.000.

Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gert; and Wachtel, Helmut, to Schering Aktiengesellschaft. 4-(Polyalkoxyphenyl)-2-pyrrolidones (II). 4,153,713, Cl. 424-274.000.
Hwang, Ki-Sup: *See*—
Zabiak, Daniel M.; and Hwang, Ki-Sup, 4,153,593, Cl. 260-29.6ME.
Hy-Mac Limited: *See*—
Armstrong, Anthony C., 4,153,301, Cl. 299-36.000.
Hydroacoustics Inc.: *See*—
Bouyoucos, John V., 4,153,135, Cl. 181-120.000.
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Tsuruta, Hideki; Yamamoto, Mamoru; and Kato, Kenichi, to Teijin Limited. Inclusion compounds, process for preparation thereof, and process for separating isomers using the inclusion compounds. 4,153,630, Cl. 260-578.000.
ICI Americas Inc.: *See*—
Hartmann, Ludwig A., 4,153,621, Cl. 260-348.640.
Ideal Industries Incorporated: *See*—
Wells, Peter M., Jr., 4,152,797, Cl. 7-129.000.
Idemitsu Kosan Company Limited: *See*—
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,153,508, Cl. 195-31.00P.
Narita, Yoshihiro; Konuma, Hideo; Tagami, Sanae; and Yamada, Hirosi, 4,153,780, Cl. 528-198.000.
Iguchi, Shigeru; Iwata, Tamotu; and Yano, Tetsuo, to Mitsubishi Paper Mills, Ltd. Photographic binder mixture of three polymers. 4,153,458, Cl. 96-67.000.
Iijima, Toshifumi; Obikawa, Tadahiko; and Tanaka, Motoaki, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,153,460, Cl. 96-74.000.
Iio, Katsuro; Takenouchi, Naoki; and Yamada, Kimio, to Kobe Steel, Ltd. Overhead submerged arc welding process. 4,153,832, Cl. 219-124.340.
Iizuka, Haruhiko, to Nissan Motor Company, Limited. System for disabling some cylinders of internal combustion engine. 4,153,033, Cl. 123-198.00F.
Iizuka, Yoshio: *See*—
Miwa, Hirohide; Oikawa, Kiyoshi; and Iizuka, Yoshio, 4,153,916, Cl. 358-257.000.
Ikawa, Kazuo; Hirohata, Michio; Matsuda, Mutsuhide; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Camera incorporated with a movable flash light device. 4,153,355, Cl. 354-33.000.
Ikeda, Seito. Greeting card with holding toy. 4,152,865, Cl. 46-116.000.
Ikegami, Hidetsugu. Method and device for generating a magnetic field of a potential with electric current components distributed according to a derivative of the potential. 4,153,889, Cl. 335-213.000.
Ikegaya, Seiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Heat insulator for a carburetor. 4,153,029, Cl. 123-141.000.
Ikeguchi, Shigehiko; and Yamashita, Norio, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co. Ltd. Frequency synthesizer for transmitter/receiver using a phase locked loop. 4,153,884, Cl. 331-1.00A.
Ikenaga, Toshiaki: *See*—
Hirai, Shin-Ichiro; Ikenaga, Toshiaki; and Matsuzawa, Tai, 4,153,689, Cl. 424-178.000.
Illinois Tool Works Inc.: *See*—
Benno, Edward L., 4,153,155, Cl. 206-150.000.
Ilnitsky, Vladimir Y.: *See*—
Rumyantsev, Leonid A.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,152,894, Cl. 60-347.000.
Imler, Jacques; and Masek, Karel. Process and arrangement for filling gas cylinders. 4,153,083, Cl. 141-4.000.
Imperial Chemical Industries Limited: *See*—
Bostock, Susan M.; Boyd, Violet; Fishwick, Brian R.; Glover, Brian; and Korn, Stewart R., 4,153,413, Cl. 8-41.00C.
Fern, William A.; and Rodriguez, Philip A. B., 4,153,624, Cl. 260-453.00P.
Hancock, Roger I., 4,153,583, Cl. 252-550.000.
Vallance, Christopher; and Davies, Peter J., 4,153,530, Cl. 204-252.000.
Incom International Inc.: *See*—
Langford, William D., 4,152,950, Cl. 74-471.0XY.
Indiana University Foundation: *See*—
Muhler, Joseph C.; Kleber, Carl J.; and Kelly, Ray G., 4,153,732, Cl. 426-72.000.
Industrie Pirelli Societa per Azioni: *See*—
Longoni, Sergio, 4,153,332, Cl. 350-96.230.
Ingersoll-Rand Company: *See*—
Wall, Geoffrey F., 4,152,943, Cl. 74-87.000.
Inland Industries Inc.: *See*—
Berry, Bernie B., Jr.; and Melvin, Myron F., 4,152,854, Cl. 40-610.000.
Inokawa, Tsuneo: *See*—
Oshima, Masanao; Tabuchi, Hiroshi; and Inokawa, Tsuneo, 4,152,999, Cl. 114-42.000.
Inoue, Akira: *See*—
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,153,508, Cl. 195-31.00P.
Inoue, Shigeki: *See*—
Yoshida, Akitoshi; Kosaka, Masaharu; and Inoue, Shigeki, 4,153,591, Cl. 260-29.60S.
Institut Fiziki Akademii Nauk Latviiskoi SSR: *See*—
Kulberg, Anton Y.; Kalnin, Robert K.; Ioffe, Benyamin A.; Litvinenko, Semen K.; and Leikin, Roman S., 4,153,151, Cl. 198-456.000.
Institut Francais du Petrole: *See*—
Espitalie, Jean; Laporte, Jean-Loup; Madec, Marcel; and Marquis, Francois, 4,153,415, Cl. 23-230.0EP.
Institut National de Recherche et de Securite pour la Prevention des Accidents du Travail et des Maladies Professionnelles: *See*—
Boulanger, Philippe; and Roure, Lucien, 4,153,295, Cl. 297-307.000.
Institut Po Metaloznanie I Technologia Na Metalite: *See*—
Balevski, Angel T.; Nikolov, Ivan D.; and Antonov, Asparuch M., 4,153,100, Cl. 164-155.000.
Intel Corporation: *See*—
Blume, Henry M., Jr.; Stamm, David A.; and Budde, David L., 4,153,933, Cl. 364-200.000.
Interlake, Inc.: *See*—
Marlin, Louis A., 4,153,421, Cl. 44-51.000.
International Business Machines Corporation: *See*—
Actor, Elliot J.; and Kantner, Robert F., 4,153,945, Cl. 364-900.000.
Antonetti, Vincent W.; and Gupta, Omkarath R., 4,153,107, Cl. 165-185.000.
Dykeman, Robert H.; and Wong, Man-Chong, 4,153,528, Cl. 204-192.00R.
Kilthau, Hans D., 4,153,746, Cl. 427-304.000.
Nosowicz, Eugene J.; and Pearson, Robert C., 4,153,950, Cl. 365-231.000.
Srinivasan, Gurumakonda R., 4,153,486, Cl. 148-175.000.
Swiss, William R.; and Young, Wayne S., 4,153,491, Cl. 156-89.000.
International Flavors & Fragrances Inc.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,811, Cl. 568-820.000.
International Harvester Company: *See*—
Gagliani, John; and Long, John V., 4,153,783, Cl. 528-337.000.
International Nickel Company, Inc., The: *See*—
Hart, Anthony C.; and Wearmouth, William R., 4,153,453, Cl. 75-123.00J.
International Tapetronics Corporation: *See*—
Jenkins, John P., 4,153,918, Cl. 360-93.000.
International Telephone and Telegraph Corporation: *See*—
Loucks, Richard S., 4,153,871, Cl. 323-19.000.
Saxon, Bruce R., 4,153,820, Cl. 179-1.00A.
Interpace Corporation: *See*—
McLeod, John S., 4,153,261, Cl. 277-205.000.
Interrad Corporation: *See*—
Marino, Frank P.; and Light, Evert P., 4,153,008, Cl. 118-634.000.
Intreprinderea de Radiatoare Si Cabluri Brasov: *See*—
Barozzi, Dan A.; Calin, Valentin; and Peter, Zsigmond, 4,153,195, Cl. 228-183.000.
Ioffe, Benyamin A.: *See*—
Kulberg, Anton Y.; Kalnin, Robert K.; Ioffe, Benyamin A.; Litvinenko, Semen K.; and Leikin, Roman S., 4,153,151, Cl. 198-456.000.
Iori, Shinichi: *See*—
Jikihara, Kazuo; Iori, Shinichi; Kimura, Ichiro; and Adachi, Kyoichi, 4,153,444, Cl. 71-94.000.
Irie, Tadashi: *See*—
Tanida, Hiroshi; and Irie, Tadashi, 4,153,629, Cl. 260-570.8TC.
Isaacson, Boris. Solar collector module and solar collector system. 4,153,037, Cl. 126-270.000.
Isaken, Ike. Dowel hole boring guide. 4,153,384, Cl. 408-115.00R.
Isheim, Maynard C., to Envirotech Corporation. Rotary sludge drying system with sand recycle. 4,153,411, Cl. 432-27.000.
Ishibashi, Kuniaki: *See*—
Harada, Yuho; Hiramatu, Kenzo; Hasegawa, Katsuhito; and Ishibashi, Kuniaki, 4,153,333, Cl. 350-96.250.
Ishibashi, Norio: *See*—
Okada, Katsuto; Yamamoto, Hideo; Teraguchi, Susumu; and Ishibashi, Norio, 4,153,544, Cl. 210-12.000.
Ishiguro, Toshihiro; and Sanno, Yasushi, to Takeda Chemical Industries, Ltd. N-Benzylpiperazines. 4,153,794, Cl. 544-358.000.
Ishikawa, Hideo: *See*—
Ueno, Haruo; Oizumi, Kyohei; Ishikawa, Hideo; Nakajima, Kohei; Tsujimoto, Nobuhiro; Kimura, Osamu; and Aikawa, Hideyuki, 4,153,767, Cl. 526-141.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Shiozaki, Hiroyuki; and Mikami, Masao, 4,152,912, Cl. 72-10.000.
Ishiyama, Nobuo: *See*—
Hamazaki, Yasuhiko; Yamamoto, Toshiyuki; Kawabata, Shozo; Seri, Kenji; Sakasai, Masao; Sato, Reiko; and Ishiyama, Nobuo, 4,153,724, Cl. 424-308.000.
Ishiyama, Saburo: *See*—
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,153,508, Cl. 195-31.00P.
Isono, Katsuo; and Sanada, Seiji, to Sony Corporation. Color correction circuit for a color television receiver. 4,153,911, Cl. 358-10.000.
Itek Corporation: *See*—
Buchan, William R., 4,153,335, Cl. 350-150.000.
Slenkovich, Geoge L., 4,153,951, Cl. 365-239.000.
Ithaca Gun Company: *See*—
Tollinger, James; and Joslyn, Edward P., 4,152,856, Cl. 42-69.00B.
Ito, Miyotsugu. Swivel hook. 4,152,814, Cl. 24-241.0PS.

Ito, Shintaro: *See—*
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,153,487, Cl. 148-175.000.

Itoh, Seiichi; and Suzuki, Kensuke, to Hitachi, Ltd. Molded semiconductor device with header leads. 4,153,910, Cl. 357-68.000.

Iura, Yukio: *See—*
Kodaira, Noboru; Tezuka, Nobuo; Senuma, Mitio; Hashimoto, Teiji; Uchidoi, Masanori; and Iura, Yukio, 4,153,360, Cl. 354-241.000.

Ivanyatov, Jury E.: *See—*
Kolosov, Ivan A.; Ivanyatov, Jury E.; and Khoroshilov, Anatoly K., 4,152,880, Cl. 53-553.000.

Iwahana, Keiichi; Mathuda, Yoshimi; and Futamura, Kenichiro, to Taiho Kogyo Co., Ltd. Aluminum-base bearing alloy and composite. 4,153,756, Cl. 428-653.000.

Iwasaki, Toshio: *See—*
Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, 4,153,454, Cl. 75-124.000.

Iwata, Tamotu: *See—*
Iguchi, Shigeru; Iwata, Tamotu; and Yano, Tetsuo, 4,153,458, Cl. 96-67.000.

Iwata, Toshiharu: *See—*
Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, 4,153,021, Cl. 123-119.0EC.

J. D. Engineering Services Pty. Ltd.: *See—*
Marrington, Jack D., 4,153,187, Cl. 222-440.000.

J. I. Case Company: *See—*
Stoychoff, Terry A., 4,153,087, Cl. 144-34.00E.

Jackson, Winston J., Jr.; Gebeau, Gary G.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Liquid crystal copolyester containing a substituted phenylhydroquinone. 4,153,779, Cl. 528-176.000.

Jacobsen Manufacturing Company: *See—*
Gandrud, Merlin H.; and Woelffer, Neill C., 4,152,884, Cl. 56-202.000.

Jacobsson, Kurt A. G., to Aktiebolaget IRO. Thread-delivery device for textile machines. 4,153,213, Cl. 242-47.010.

Jaeneke, Christian: *See—*
Romer, Rudolf; Trommsdorff, Wolf; and Jaeneke, Christian, 4,153,223, Cl. 244-3.100.

Jahn, Gerhard. Mailing pouch. 4,153,091, Cl. 150-21.000.

Jahn, Ulrich: *See—*
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,153,803, Cl. 560-57.000.

Jakubowski, Zenon: *See—*
Brzozowski, Zdzislaw; Magielka, Stanislaw; Angielski, Stefan; Janicki, Stanislaw; Wojcikowski, Czeslaw; and Jakubowski, Zenon, 4,153,710, Cl. 424-273.00P.

Jancis, Elmar H.: *See—*
Wheeler, Edward L.; and Jancis, Elmar H., 4,153,597, Cl. 260-45.85B.

Janda, Jaroslav: *See—*
Kakac, Karel; Slezak, Adolf; and Janda, Jaroslav, 4,153,226, Cl. 248-20.000.

Janicki, Stanislaw: *See—*
Brzozowski, Zdzislaw; Magielka, Stanislaw; Angielski, Stefan; Janicki, Stanislaw; Wojcikowski, Czeslaw; and Jakubowski, Zenon, 4,153,710, Cl. 424-273.00P.

Janotik, Adam M., to Ford Motor Company. Unipolar dynamoelectric machine with variable resistance control. 4,153,868, Cl. 322-48.000.

Janson, Bengt G. Fractionating apparatus. 4,153,543, Cl. 209-250.000.

Japan Atomic Energy Research Institute: *See—*
Araki, Kunio; Sasaki, Takashi; Tabei, Kiyoshi; and Goto, Kazuo, 4,153,525, Cl. 204-159.150.

Jaruzelski, John J., to Exxon Research & Engineering Co. Antioxidants for low ash and medium ash lubricating oils. 4,153,562, Cl. 252-46.600.

Jassawalla, Jal S.: *See—*
Clark, Kenneth D.; Jassawalla, Jal S.; and Portner, Peer M., 4,152,786, Cl. 3-1.700.

Jean Walterscheid GmbH: *See—*
von Allworden, Wilhelm, 4,153,269, Cl. 280-482.000.

Jeannin, Pierre: *See—*
Lietar, Christian; and Jeannin, Pierre, 4,153,367, Cl. 356-400.000.

Jefson, Gary B.: *See—*
Ree, Buren R.; Errede, Louis A.; Jefson, Gary B.; and Langager, Bruce A., 4,153,661, Cl. 264-120.000.

Jelinek, Richard; Rychter, Zdenek; and Peterka, Miroslav, to Ceskoslovenska akademie ved. Method for testing of embryotoxicity on chicken embryo. 4,153,676, Cl. 424-9.000.

Jenkins, John P., to International Tapetronics Corporation. Dual capstan tape transport mechanism. 4,153,918, Cl. 360-93.000.

Jikihara, Kazuo; Iori, Shinichi; Kimura, Ichiro; and Adachi, Kyoichi, to Kumiai Chemical Industry Company, Ltd. Herbicidal composition. 4,153,444, Cl. 71-94.000.

Jobe, Richard K.: *See—*
Laudenschlarger, W. Philip; Jobe, Richard K.; and Jobe, Richard P., 4,153,929, Cl. 362-348.000.

Jobe, Richard P.: *See—*
Laudenschlarger, W. Philip; Jobe, Richard K.; and Jobe, Richard P., 4,153,929, Cl. 362-348.000.

Jochum, Peter, to Hilti Aktiengesellschaft. Control member for fastening element setting device. 4,153,192, Cl. 227-10.000.

Johannah Medical Services, Inc.: *See—*
Leigh, Kay K., 4,153,160, Cl. 206-370.000.

Johannes Fuchs, Firma: *See—*
Thierer, Georg; and Dolinsek, Hans, 4,153,165, Cl. 414-133.000.

John MacDonald & Company (Pneumatic Tools) Ltd.: *See—*
Allan, David T., 4,153,121, Cl. 175-96.000.

John, Philip M., to Sterling Drug Inc. Controlled-release composition. 4,153,677, Cl. 424-19.000.

Johnson, David W., to Northern Telecom Limited. Connector for telephone cords. 4,153,327, Cl. 339-205.000.

Johnson, Edward H. Boat ladder. 4,153,137, Cl. 182-97.000.

Johnson, Lloyd E. Fuel injection valves and their manufacture. 4,152,932, Cl. 73-168.000.

Johnston, James R.: *See—*
Moertel, George B.; and Johnston, James R., 4,153,489, Cl. 156-73.300.

Jones, Arfon H.: *See—*
Abou-Sayed, Ahmed S.; and Jones, Arfon H., 4,152,941, Cl. 73-799.000.

Jones, John F.: *See—*
Li, George S.; and Jones, John F., 4,153,648, Cl. 260-896.000.

Jones, John R. Potato chip apparatus. 4,152,975, Cl. 99-352.000.

Jones, Keith D.; Cowap, Geoffrey R.; and Bradshaw, Mark R., to Grundy & Partners Limited. Navigational aid. 4,153,935, Cl. 364-461.000.

Jones, Owen P., to National Seed Development Organisation Limited; and Kent Incorporated Society for Promoting Experiments in Horticulture, The. Propagating woody plant material. 4,152,869, Cl. 47-58.000.

Jones, Robert H.: *See—*
Crasto, Lloyd T.; Jones, Robert H.; and Klock, John C., 4,153,451, Cl. 75-77.000.

Jones, Robert W.: *See—*
Romanik, Lawrence J.; and Jones, Robert W., 4,152,963, Cl. 83-762.000.

Jones, Thornton K.: *See—*
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,153,482, Cl. 148-23.000.

Joppien, Hartmut, both of: *See—*
Puttner, Reinhold; and Joppien, Hartmut, both of, 4,153,705, Cl. 424-270.000.

Joslyn, Edward P.: *See—*
Tollinger, James; and Joslyn, Edward P., 4,152,856, Cl. 42-69.00B.

Jossin, Alain: *See—*
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,153,698, Cl. 424-258.000.
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,153,699, Cl. 424-258.000.

Joyner, Robert G., to Dana Corporation. Slip spline seal assembly. 4,153,260, Cl. 277-181.000.

Jungfer, Helmut, heir: *See—*
Jungfer, Leopold, deceased; Jungfer, Helmut, heir; Meyenburg, Ingeborg, heir; Kautschitsch, Dieter; and Weber, Richard, 4,153,867, Cl. 320-43.000.

Jungfer, Leopold, deceased; by Jungfer, Helmut, heir; by Meyenburg, Ingeborg, heir; Kautschitsch, Dieter; and Weber, Richard, to Akkumulatoren-fabrik Dr. Leopold Jungfer. Device for determining the charge condition for a secondary electric storage battery. 4,153,867, Cl. 320-43.000.

Jurin, Ivan L.: *See—*
Rumyantsev, Leonid A.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,152,894, Cl. 60-347.000.

Justus, Edgar J., to Beloit Corporation. Twin-wire fibrous web former and method. 4,153,504, Cl. 162-133.000.

Kabell, Louis J.: *See—*
Rau, John W., III; Muller, Harold H.; Tam, Richard K. W.; and Kabell, Louis J., 4,153,949, Cl. 365-104.000.

Kabushika Kaisha Komatsu Seisakusho: *See—*
Tohma, Hideaki; and Uehara, Kazuo, 4,152,896, Cl. 60-445.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Fukuichi, Takuro, 4,152,887, Cl. 58-19.00R.

Kabushiki Kaisha Suwa Seikosha: *See—*
Mikoshiba, Hitoshi; and Tezuka, Chikao, 4,152,982, Cl. 101-93.220.

Kaestner, Erwin A. Mobile perpetually self-correcting estimated time of arrival calculator. 4,153,874, Cl. 324-161.000.

Kakac, Karel; Slezak, Adolf; and Janda, Jaroslav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Supporting mechanism. 4,153,226, Cl. 248-20.000.

Kaken Chemical Co., Ltd.: *See—*
Hamazaki, Yasuhiko; Yamamoto, Toshiyuki; Kawabata, Shozo; Seri, Kenji; Sakasai, Masao; Sato, Reiko; and Ishiyama, Nobuo, 4,153,724, Cl. 424-308.000.

Kalfoglou, George; and Flournoy, Kenoth H., to Texaco Inc. Oil-in-water emulsions. 4,153,573, Cl. 252-312.000.

Kalfoglou, George; and Flournoy, Kenoth H., to Texaco Inc. Method for transportation of viscous hydrocarbons by pipeline. 4,153,575, Cl. 252-352.000.

Kalkhof, Bernd W., to Robert Bosch GmbH. Apparatus for preventing sparks in the ignition system of an engine while the engine is at rest. 4,153,031, Cl. 123-146.50D.

Kalkstein, James L.: *See—*
Kennedy, Leroy P.; and Kalkstein, James L., 4,153,305, Cl. 303-81.000.

Kallet, Eli A.; and Cravitt, Samuel, to Farrand Optical Co., Inc. Convertible dual beam differential spectrofluorometer and absorption meter. 4,153,369, Cl. 356-318.000.

Kalnin, Robert K.: *See*—
Kulberg, Anton Y.; Kalnin, Robert K.; Ioffe, Benyamin A.; Litvinenko, Semen K.; and Leikin, Roman S., 4,153,151, Cl. 198-456.000.

Kalugin, Anatoly A.: *See*—
Alshits, Mark Z.; Kalugin, Anatoly A.; Sokolov, Gennady I.; and Kovalev, Evgeny P., 4,152,850, Cl. 37-97.000.

Kam, George H.: *See*—
Arumugham, Rangaswamy; and Kam, George H., 4,153,914, Cl. 358-195.000.

Kamath, Venkatesh: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,811, Cl. 568-820.000.

Kamikawa, Kiyohide, to Shimano Industrial Company Limited. Fishing reel. 4,153,219, Cl. 242-84.51R.

Kanayama, Yoshio, to Sharp Kabushiki Kaisha. Bubble removal in an ink liquid supply for an ink jet system printer. 4,153,902, Cl. 346-140.00R.

Kanebo Ltd.: *See*—
Koide, Tohru; Ezawa, Tabashi; Onoda, Hideki; Masaki, Chiharu; and Morita, Tohru, 4,153,766, Cl. 526-59.000.

Kantner, Robert F.: *See*—
Actor, Elliot J.; and Kantner, Robert F., 4,153,945, Cl. 364-900.000.

Kao Soap Co., Ltd.: *See*—
Ogata, Yuzuru; Kawaguchi, Takeshi; Kinoshita, Ikuya; Nakayama, Hirokazu; and Ukena, Toshinao, 4,153,770, Cl. 526-209.000.

Kaplan, Leonard; Walker, Wellington E.; and O'Connor, George L., to Union Carbide Corporation. Promoting propylene glycol formation with compounds of aluminum. 4,153,623, Cl. 260-449.00L.

Kappel, Ernst, to BASF Aktiengesellschaft. Plant growth regulators. 4,153,445, Cl. 71-94.000.

Kardash, William E., Jr., to United States of America, Attorney General. Vehicle barricade. 4,152,871, Cl. 49-49.000.

Karey, Hans: *See*—
Heintke, Hans E.; Karey, Hans; and Oberheim, Robert, 4,153,359, Cl. 354-126.000.

Karl Lautenschlager KG, Mobelbeschlagfabrik: *See*—
Lautenschlager, Gerhard, 4,152,811, Cl. 16-164.000.

Karlsson, Elis: *See*—
Tomic, Relja; Aberg, Ulf; and Karlsson, Elis, 4,153,439, Cl. 65-2.000.

Karol, Frederick J.; Wu, Chisung; Reichle, Walter T.; and Maraschin, Norma J., to Union Carbide Corporation. Cyclopentadienyl chromium oxides. 4,153,576, Cl. 252-428.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. Phenoxy (benzyloxy/-benzylthio) benzene derivatives. 4,153,731, Cl. 424-337.000.

Kasper Instruments, Inc.: *See*—
Hofmeister, Lucien; and Schulte, Harvey L., 4,153,164, Cl. 211-41.000.

Kastening, Bertel: *See*—
Faul, Wolfgang; and Kastening, Bertel, 4,153,531, Cl. 204-263.000.

Kastle (Schweiz) AG: *See*—
Buttner, Franz, deceased, 4,153,271, Cl. 280-615.000.

Kato, Kenichi: *See*—
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Tsuruta, Hideki; Yamamoto, Mamoru; and Kato, Kenichi, 4,153,630, Cl. 260-578.000.

Kato, Yasuo; Komoda, Tsutomu; and Tomura, Teruichi, to Hitachi, Ltd. Stereoscopic image observing apparatus. 4,153,334, Cl. 350-132.000.

Kautschitsch, Dieter: *See*—
Jungfer, Leopold, deceased; Jungfer, Helmut, heir; Meyenburg, Ingeborg, heir; Kautschitsch, Dieter; and Weber, Richard, 4,153,867, Cl. 320-43.000.

Kawabata, Shozo: *See*—
Hamazaki, Yasuhiko; Yamamoto, Toshiyuki; Kawabata, Shozo; Seri, Kenji; Sakasai, Masao; Sato, Reiko; and Ishiyama, Nobuo, 4,153,724, Cl. 424-308.000.

Kawada, Hiroitsu: *See*—
Matsui, Hidefumi; Tomioka, Kenichi; Kawada, Hiroitsu; and Maeno, Hiroo, 4,153,727, Cl. 414-317.000.

Kawaguchi, Takeshi: *See*—
Ogata, Yuzuru; Kawaguchi, Takeshi; Kinoshita, Ikuya; Nakayama, Hirokazu; and Ukena, Toshinao, 4,153,770, Cl. 526-209.000.

Kawai Musical Instrument Mfg. Co. Ltd.: *See*—
Deutsch, Ralph, 4,152,966, Cl. 84-1.240.

Kawamoto, Junji: *See*—
Sawada, Hideo; and Kawamoto, Junji, 4,153,064, Cl. 131-267.000.

Kawamura, Naoto: *See*—
Tajima, Akira; and Kawamura, Naoto, 4,153,339, Cl. 350-184.000.

Kawamura, Yoshio; and Moriyama, Shigeo, to Hitachi, Ltd. Automatic focusing apparatus. 4,153,341, Cl. 350-255.000.

Kawasaki Jukogyo Kabushiki: *See*—
Sato, Masato; and Nakamizo, Keiichi, 4,153,034, Cl. 123-198.00E.

Kawasaki, Koichiro; Okada, Kazushige; Suginaka, Yutaka; Adachi, Tokuichi; and Shirasu, Akira, to Meiji Nyugyo Kabushiki Kaisha. Automatic weighing and distributing apparatus for topping sliced cheese, etc. on pie crusts. 4,152,976, Cl. 99-450.100.

Kawasaki Steel Corporation: *See*—
Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, 4,153,454, Cl. 75-124.000.

Kayser, Hans D.: *See*—
Bauch, Ernst; Kayser, Hans D.; and Peters, Herbert, 4,153,212, Cl. 242-47.000.

Kearney & Trecker Corporation: *See*—
Caddell, Richard W., 4,153,941, Cl. 364-900.000.

Keeler, Frederick D., to KLM Company, The. Tamper-proof closure. 4,153,174, Cl. 215-252.000.

Kefalas A/S: *See*—
Buus, Jorn L. M.; and Lassen, Niels, 4,153,694, Cl. 424-247.000.

Kehr, Wolfgang: *See*—
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gert; and Wachtel, Helmut, 4,153,713, Cl. 424-274.000.

Keil, Karl-Heinz: *See*—
Humuller, Edwin; Keil, Karl-Heinz; and Ribka, Joachim, 4,153,561, Cl. 252-8.750.

Keller, George M. Apparatus for producing cast-in-place pipe employing permanent pipe mold. 4,153,398, Cl. 425-59.000.

Kellie, Truman F., to Minnesota Mining and Manufacturing Company. High resolution halftone microimages and method therefor. 4,153,457, Cl. 96-27.00H.

Kelly, Ray G.: *See*—
Muhler, Joseph C.; Kleber, Carl J.; and Kelly, Ray G., 4,153,732, Cl. 426-72.000.

Kemmetmueller, Roland, to Waagner-Biro Aktiengesellschaft. Apparatus for delivering treating gas to bulk material such as hot coke or coal situated in a container. 4,152,843, Cl. 34-229.000.

Kemper, Yves, to Vadetec Corporation. Transmission devices. 4,152,946, Cl. 74-193.000.

Kemper, Yves J., to Vadetec Corporation. Piston type energy conversion machine. 4,152,944, Cl. 74-191.000.

Kemper, Yves J., to Vadetec Corporation. Power transmitting mechanism. 4,152,945, Cl. 74-191.000.

Kennedy, Joseph P.: *See*—
Buckley, Donald J.; Thaler, Warren A.; and Kennedy, Joseph P., 4,153,773, Cl. 526-308.000.
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 4,153,584, Cl. 260-5.000.

Kennedy, Leroy P.; and Kalkstein, James L., to Abex Corporation. Railroad air brake systems. 4,153,305, Cl. 303-81.000.

KeNova AB: *See*—
Nilson, Billy N., 4,153,185, Cl. 222-212.000.

Kent Incorporated Society for Promoting Experiments in Horticulture, The: *See*—
Jones, Owen P., 4,152,869, Cl. 47-58.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Barnert, Eike, 4,153,004, Cl. 118-48.000.
Faul, Wolfgang; and Kastening, Bertel, 4,153,531, Cl. 204-263.000.
Kirschner, Jurgen, 4,153,844, Cl. 250-492.00R.

Kerr-McGee Corporation: *See*—
Leonard, Robert E.; and Rhodes, Donald E., 4,153,538, Cl. 208-177.000.

Kersting, R. James; and Harris, James J., to Arco Polymers, Inc. Resin-coated glass articles. 4,153,171, Cl. 215-12.00R.

Kessler, Stephen B., to Becton, Dickinson and Company. Method for collecting blood. 4,153,739, Cl. 427-2.000.

Kestler, Kenneth C.: *See*—
Edmond, Tibor O.; and Kestler, Kenneth C., 4,152,929, Cl. 73-581.000.

Ketterer, Dieter, to Heckler & Koch GmbH. Means for loading small firearms including a box magazine and cartridge clips. 4,152,857, Cl. 42-88.000.

Keyworth, Donald A.; and Sudduth, Jerome R., to Tenneco Chemicals, Inc. Recovery of metals from bimetallic salt complexes. 4,153,452, Cl. 75-101.0BE.

Keyworth, Donald A.; and Sudduth, Jerome R., to Tenneco Chemicals, Inc. Removal of metals from waste materials that contain bimetallic salt complexes. 4,153,669, Cl. 423-24.000.

Kharitonov, Alexandr G.: *See*—
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Khoroshilov, Anatoly K.: *See*—
Kolosov, Ivan A.; Ivanyatov, Jury E.; and Khoroshilov, Anatoly K., 4,152,880, Cl. 53-553.000.

Khovaylo, Modest: *See*—
Gersin, Robert P.; Totaro, Charles S.; Gebhardt, Roland; and Khovaylo, Modest, 4,152,803, Cl. 15-104.940.

Kiener, Volker: *See*—
Boehn, Hugo; Treptow, Wolfram; Wunsch, Gerd; Kiener, Volker; Meyer, Hermann; and Csizi, Gotthard, 4,153,742, Cl. 427-126.000.

Kiersztyn, Stanley E.: *See*—
MacKenzie, Burton T., Jr.; Prober, Maurice; and Kiersztyn, Stanley E., 4,153,752, Cl. 428-379.000.

Kihlstrom, Christer. Method and apparatus for filtering out solid particles from a gas with peat litter. 4,153,433, Cl. 55-97.000.
Kikusui Kagaku Kogyo Kabushiki Kaisha: *See—*
Yoshida, Akitoshi; Kosaka, Masaharu; and Inoue, Shigeki, 4,153,591, Cl. 260-29.60S.
Kilthau, Hans D., to International Business Machines Corporation. Method of sensitizing copper surfaces with sensitizing solution containing stannous ions, precious metal ions and EDTA. 4,153,746, Cl. 427-304.000.
Kim, Larisa P.: *See—*
Litvak, Rafael S.; Rannev, Georgy G.; Anash, Shulim A.; Kim, Larisa P.; Pen-Chen-Sek, Alexandr I.; Borkov, Gennady E.; Nikiforov, Anatoly E.; Shutchenko, Vladimir G.; and Tabachnikov, Mikhail M., 4,153,521, Cl. 204-105.00R.
Kimata, Kei; Nakazeki, Tsugito; and Yasuda, Yoshinobu, to NTN Toyo Bearing Co. Ltd. Air flow measuring device for internal combustion engines. 4,153,018, Cl. 123-103.00R.
Kimball International, Inc.: *See—*
Howell, Stephen L., 4,152,965, Cl. 84-1.030.
Kimura, Ichiro: *See—*
Jikihara, Kazuo; Iori, Shinichi; Kimura, Ichiro; and Adachi, Kyoichi, 4,153,444, Cl. 71-94.000.
Kimura, Masaharu: *See—*
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, 4,153,644, Cl. 260-876.00B.
Kimura, Osamu: *See—*
Ueno, Haruo; Oizumi, Kyohei; Ishikawa, Hideo; Nakajima, Kohei; Tsujimoto, Nobuhiro; Kimura, Osamu; and Aikawa, Hideyuki, 4,153,767, Cl. 526-141.000.
Kincaid, Frank, to Collegiate Cap and Gown Company. Disposable garment for wear by a person being immersed in a liquid. 4,152,782, Cl. 2-74.000.
King, William H.; Kraus, Bernhard J.; and Belyo, Steven C., to United States of America, Environmental Protection Agency. Method and apparatus for spark control of engine knock. 4,153,020, Cl. 123-117.00R.
King, William L.; King, William U.; and Spector, George. Hydraulic log splitter attachment for farm tractors and industrial tractors. 4,153,088, Cl. 144-193.00A.
King, William U.: *See—*
King, William L.; King, William U.; and Spector, George, 4,153,088, Cl. 144-193.00A.
Kinoshita, Ikuya: *See—*
Ogata, Yuzuru; Kawaguchi, Takeshi; Kinoshita, Ikuya; Nakayama, Hirokazu; and Ukena, Toshinao, 4,153,770, Cl. 526-209.000.
Kioritz Corporation: *See—*
Akaike, Junichi; and Sato, Masatoshi, 4,152,832, Cl. 30-276.000.
Kirk, Norbert A. Apparatus for introducing pressurized gas into a tire. 4,153,096, Cl. 152-415.000.
Kirkbride, Chalmer G. Shale conversion process. 4,153,533, Cl. 208-11.00R.
Kirschner, Jurgen, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Measuring apparatus for degree of spin polarization of an electron beam. 4,153,844, Cl. 250-492.00R.
Kitamoto, Tatsuji: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, 4,153,920, Cl. 360-55.000.
Kiwi Coders Corporation: *See—*
Siegal, Burton L., 4,152,980, Cl. 101-35.000.
Kleber, Carl J.: *See—*
Muhler, Joseph C.; Kleber, Carl J.; and Kelly, Ray G., 4,153,732, Cl. 426-72.000.
Kleemann, Axel; Klingler, Karl H.; von Schlichtegroll, Ansgar; Stroman, Fritz; Thiemer, Klaus; and Westermann, Erik, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Dihydroxyphenylethylaminoalkyl theophyllines. 4,153,696, Cl. 424-253.000.
Klein, Robert R.: *See—*
Makowski, Henry S.; Klein, Robert R.; and Lundberg, Robert D., 4,153,588, Cl. 260-23.50A.
Klein, William G., to United Technical Products, Inc. Carpeting. 4,153,749, Cl. 428-95.000.
Kleinerman, Marcos. Immunofluorometric method and apparatus for measuring minute quantities of antigens, antibodies and other substances. 4,153,675, Cl. 424-8.000.
Klingler, Karl H.: *See—*
Kleemann, Axel; Klingler, Karl H.; von Schlichtegroll, Ansgar; Stroman, Fritz; Thiemer, Klaus; and Westermann, Erik, 4,153,696, Cl. 424-253.000.
Klink, Rainer; and Konig, Gunther, to Deutsche Automobilgesellschaft mbH, Firma. Structural unit for an electric vehicle. 4,153,127, Cl. 180-65.00R.
KLM Company, The: *See—*
Keeler, Frederick D., 4,153,174, Cl. 215-252.000.
Klock, John C.: *See—*
Crasto, Lloyd T.; Jones, Robert H.; and Klock, John C., 4,153,451, Cl. 75-77.000.
Klockner-Humboldt-Deutz AG: *See—*
Bender, Hans; Zabel, Wolf; Duren, Gottfried; and Unkelbach, Karl-Heinz, 4,153,542, Cl. 209-223.00R.
Klove, Edwin H., Jr.: *See—*
Rogers, Lloyd W., Jr.; and Klove, Edwin H., Jr., 4,153,274, Cl. 280-745.000.
Kluczynski, Achim: *See—*
Blank, Rudolf; and Kluczynski, Achim, 4,153,350, Cl. 352-78.00R.
Kluger, Edward W.; Miley, John W.; and Su, Tien K., to Milliken Research Corporation. Additives for lubricants and fuels. 4,153,567, Cl. 252-51.50A.
Klundt, Kurt, to Pfaff Industriemaschinen GmbH. Sewing machine having a driven feed roller. 4,152,995, Cl. 112-318.000.
Knap, Joseph, to Canadair Limited. Slidable door closure and hanger system for passenger vehicle. 4,152,870, Cl. 49-118.000.
Knothe, Erich; Berg, Christoph; and Melcher, Franz J., to Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrik GmbH). Electromagnetically compensating beam balance. 4,153,124, Cl. 177-210.0EM.
Knothe, Erich; Berg, Christoph; Stadler, Eberhard; and Kohne, Hans-Heinrich, to Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrick GmbH). Parallel construction for a top-loading balance. 4,153,126, Cl. 177-229.000.
Knox Manufacturing Co.: *See—*
Brown, Donald J., 4,152,852, Cl. 40-361.000.
Ko, Keiun: *See—*
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, 4,153,644, Cl. 260-876.00B.
Kobe Steel, Ltd.: *See—*
Iio, Katsuro; Takenouchi, Naoki; and Yamada, Kimio, 4,153,832, Cl. 219-124.340.
Ogata, Kazuo; and Furuta, Seiya, 4,153,485, Cl. 148-126.000.
Kobel, Erich, to Merck Patent Gesellschaft mit beschrankter Haftung. Stopper for two-chamber mixing syringe. 4,153,057, Cl. 128-272.100.
Kober AG: *See—*
Koster, Waldemar; and Huber, Reinhold, 4,152,799, Cl. 14-16.100.
Koch, George P.: *See—*
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., 4,153,464, Cl. 106-14.270.
Kocsis, Oliver: *See—*
Domok, Istvan; Kocsis, Oliver; Banszki, Miklos; and Horvath, Jeno, 4,152,829, Cl. 30-139.000.
Kodaira, Noboru; Tezuka, Nobuo; Senuma, Mitio; Hashimoto, Teiji; Uchidoi, Masanori; and Iura, Yukio, to Canon Kabushiki Kaisha. Focal plane shutter for a camera. 4,153,360, Cl. 354-241.000.
Kofron, Vernon K., to Vactec, Incorporated. Photovoltaic cell with junction-free essentially-linear connections to its contacts. 4,153,907, Cl. 357-30.000.
Kohne, Hans-Heinrich: *See—*
Knothe, Erich; Berg, Christoph; Stadler, Eberhard; and Kohne, Hans-Heinrich, 4,153,126, Cl. 177-229.000.
Koide, Tohru; Ezawa, Tabashi; Onoda, Hideki; Masaki, Chiharu; and Morita, Tohru, to Kanebo Ltd. Continuous process for the production of ethylene terephthalate polyesters. 4,153,766, Cl. 526-59.000.
Koike, Kiyoshi: *See—*
Sonoda, Noriaki; and Koike, Kiyoshi, 4,153,106, Cl. 165-174.000.
Koizumi, Mituyoshi; Akiyama, Nobuyuki; and Kuni, Asahiro, to Hitachi, Ltd. Method and apparatus for reduction-projection type mask alignment. 4,153,371, Cl. 356-400.000.
Kok, Pieter W., to North American Philips Corporation. Pneumoencephalography chair. 4,153,841, Cl. 250-439.00R.
Kolbe, Andreas: *See—*
Dinter, Peter; and Kolbe, Andreas, 4,153,560, Cl. 250-531.000.
Kolosov, Ivan A.; Ivanyatov, Jury E.; and Khoroshilov, Anatoly K. Device for packing flat articles. 4,152,880, Cl. 53-553.000.
Komancheck, John J.: *See—*
Cozine, Mark L.; Komancheck, John J.; and Riffanacht, John D., 4,153,436, Cl. 55-290.000.
Komoda, Tsutomu: *See—*
Kato, Yasuo; Komoda, Tsutomu; and Tomura, Teruichi, 4,153,334, Cl. 350-132.000.
Kongo Co., Ltd.: *See—*
Taniwaki, Genshi, 4,153,312, Cl. 312-198.000.
Konig, Gunther: *See—*
Klink, Rainer; and Konig, Gunther, 4,153,127, Cl. 180-65.00R.
Konishiroku Photo Industry Co., Ltd: *See—*
Iijima, Toshifumi; Obikawa, Tadahiko; and Tanaka, Motoaki, 4,153,460, Cl. 96-74.000.
Konkle, Donald W.: *See—*
Holmes, Dale E.; Konkle, Donald W.; Warner, C. James; and Hansen, Richard L., 4,153,248, Cl. 273-58.00A.
Konuma, Hideo: *See—*
Narita, Yoshihiro; Konuma, Hideo; Tagami, Sanae; and Yamada, Hirosi, 4,153,780, Cl. 528-198.000.
Koontz, Donald E.; and Turner, Dennis R., to Bell Telephone Laboratories, Incorporated. Continuous electrochemical processing apparatus. 4,153,523, Cl. 204-129.600.
Koper, James G.: *See—*
Ljung, Bo H. G.; and Koper, James G., 4,153,317, Cl. 316-19.000.
Korczykowski, Lawrence L., to Eaton Corporation. Control mechanism. 4,152,951, Cl. 74-474.000.
Korn, Stewart R.: *See—*
Bostock, Susan M.; Boyd, Violet; Fishwick, Brian R.; Glover, Brian; and Korn, Stewart R., 4,153,413, Cl. 8-41.00C.
Korostoff, Edward; and Davidovitch, Zeev, to University of Pennsylvania. Method and apparatus for electrically enhanced bone growth and tooth movement. 4,153,060, Cl. 128-419.00F.
Kosaka, Masaharu: *See—*
Yoshida, Akitoshi; Kosaka, Masaharu; and Inoue, Shigeki, 4,153,591, Cl. 260-29.60S.
Koskenniska, Lasse A.: *See—*
Lamminkari, Eero K.; and Koskenniska, Lasse A., 4,153,622, Cl. 260-397.250.

Koster, Waldemar; and Huber, Reinhold, to Kober AG. Slide swing bearing. 4,152,799, Cl. 14-16.100.

Kotov, Valery P.: *See*—
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Koutsky, James A.: *See*—
Acker, Jan R.; Braton, Norman R.; Koutsky, James A.; and Wendt, Robert F., 4,153,555, Cl. 210-198.00R.

Kovalev, Evgeny P.: *See*—
Alshits, Mark Z.; Kalugin, Anatoly A.; Sokolov, Gennady I.; and Kovalev, Evgeny P., 4,152,850, Cl. 37-97.000.

Koyo Seiko Company Limited: *See*—
Fujimoto, Shoji; and Matsushima, Tatsuo, 4,152,930, Cl. 73-136.00R.

Kozacka, Frederick J., to Gould Inc. Fusible element and process of manufacturing said element. 4,153,892, Cl. 337-159.000.

Kozlov, Vasily F.: *See*—
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Kraemer & Grebe GmbH & Co. KG: *See*—
Vomhof, Paul; Reiss, Adam; and Schmidt, Karl-Heinz, 4,153,208, Cl. 241-82.400.

Kraft, Peter: *See*—
Edelmann, Hermann; Kraft, Peter; Mann, Karlheinz; Schuler, Peter; and Hagen, Alexander, 4,153,513, Cl. 195-103.50R.

Kramer, Daniel E.: *See*—
Chopra, Ram K.; and Kramer, Daniel E., 4,152,900, Cl. 62-80.000.

Krainer, Jurgen, to Dual Gebruder Steidinger. Protective hood for cassette tape recorders. 4,153,919, Cl. 360-129.000.

Kramer Trenton Co.: *See*—
Chopra, Ram K.; and Kramer, Daniel E. (said Ram Kumar Chopra assors. to), 4,152,900, Cl. 62-80.000.

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Krasberg, Alan R. Manned submarine. 4,153,001, Cl. 114-312.000.

Kraus, Bernhard J.: *See*—
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Kraus, Theodore C.: *See*—
Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., 4,153,643, Cl. 260-861.000.

Krauss-Maffei AG: *See*—
Hultsch, Gunther; and Wilkesmann, Helmut, 4,153,551, Cl. 210-78.000.

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Pombrol, Rogelio R., 4,153,321, Cl. 339-95.00B.

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Hilber, Johann, 4,153,267, Cl. 280-281.00R.

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Kresse, Peter: *See*—
Hund, Franz; and Kresse, Peter, 4,153,465, Cl. 106-14.250.

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Hennemann, Manfred; Lohr, Albrecht; and Krings, Peter, 4,153,570, Cl. 252-121.000.

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Kubiatowicz, James F., to Custom Concepts, Incorporated. Popper toy. 4,152,863, Cl. 46-1.00R.

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Haefner, Albert J.; and Kucsma, Michael E., 4,153,206, Cl. 241-14.000.

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Kugelfischer Georg Schafer & Co.: *See*—
Markfelder, Gunter; and Hofmann, Heinrich, 4,153,309, Cl. 308-217.000.

Kuhfuss, Herbert F.: *See*—
Jackson, Winston J., Jr.; Gebeau, Gary G.; and Kuhfuss, Herbert F., 4,153,779, Cl. 528-176.000.

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Kulakova, Klavdia A.: *See*—
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Kulberg, Anton Y.; Kalnin, Robert K.; Ioffe, Benyamin A.; Litvinenko, Semen K.; and Leikin, Roman S., to Institut Fiziki Akademii Nauk Latviiskoi SSR; and Rizhsky Politekhnichesky Institut. Device for arranging ferromagnetic components at preset distance from one another. 4,153,151, Cl. 198-456.000.

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Kumm, Emerson L.; and Moriarty, Maurice J. Atomizer. 4,153,028, Cl. 123-141.000.

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Koizumi, Mituyoshi; Akiyama, Nobuyuki; and Kuni, Asahiro, 4,153,371, Cl. 356-400.000.

Kunst, Otto: *See*—
Meiller, Hermann; and Kunst, Otto, 4,153,294, Cl. 297-284.000.

Kunz, Walter: *See*—
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,153,712, Cl. 424-273.00P.

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Schwesig, Helmut; Nordsiek, Karl-Heinz; and Kupper, Friedrich-Wilhelm, 4,153,772, Cl. 526-308.000.

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Heitmeyer, Ulrich; Kupsa, Adrian; and Forster, Hans-Joachim, 4,153,128, Cl. 180-65.00E.

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Watanabe, Kazuaki; Kuramochi, Koujiro; and Ohnuma, Kiyoshi, 4,152,957, Cl. 74-606.00R.

Kurtz, Bruce E.: *See*—
Fitch, Robert H.; Kurtz, Bruce E.; and Rothmayer, Noel Y., 4,153,532, Cl. 204-267.000.

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Hutchinson, William Y.; and Kushmuk, Walter P., 4,153,125, Cl. 177-211.000.

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Nakada, Takashi, 4,153,394, Cl. 417-571.000.

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White, David B.; Pacitti, William; and Gensler, Edwin G., 4,153,292, Cl. 297-83.000.

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Wildi, Theodore; and Huard, Bertrand, 4,153,323, Cl. 339-95.00R.

Labofina S. A.: *See*—
Bracke, William J. I., 4,153,763, Cl. 521-60.000.
Lanza, Emmanuel, 4,153,645, Cl. 260-876.00R.

Lacour, Alain P.: *See*—
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., 4,153,620, Cl. 260-346.730.

Ladin, Eli M., to Federal-Mogul Corporation. Forklift mast unit with high impact bearing assembly. 4,153,308, Cl. 308-189.00R.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,153,152, Cl. 198-851.000.

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Rosenberg, Carl S., 4,153,700, Cl. 424-261.000.

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Braid, Milton; and Landis, Phillip S., 4,153,565, Cl. 252-51.50A.

Landry, Edgar F. Rotary engine or pump. 4,153,396, Cl. 418-38.000.

Lang, Gerard, to L'Oreal. Azo derivatives of pyridine n-oxide for use in hair dye compositions. 4,153,065, Cl. 132-7.000.

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Ree, Buren R.; Errede, Louis A.; Jefson, Gary B.; and Langager, Bruce A., 4,153,661, Cl. 264-120.000.

Langford, William D., to Incom International Inc. Differential and push-pull control system. 4,152,950, Cl. 74-471.0XY.

Lans, Kenneth I. T.; and Ross, Desmond E., to Texaco Trinidad, Inc. Well head retriever tool and method. 4,153,111, Cl. 166-315.000.

Lantzsch, Reinhard: *See—*
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Arlt, Dieter; and Schroer, Hans, 4,153,596, Cl. 260-45.80N.
Lanza, Emmanuel, to Labofina S. A. High-impact polystyrene and process for the production thereof. 4,153,645, Cl. 260-876.00R.
Lapeyre, James M., to Laitram Corporation, The. Bi-directional hinged conveyor belt. 4,153,152, Cl. 198-851.000.
Laporte, Jean-Loup: *See—*
Espitalie, Jean; Laporte, Jean-Loup; Madec, Marcel; and Marquis, Francois, 4,153,415, Cl. 23-230.0EP.
Larime, Carl M., to General Signal Corporation. Audible alarm with laminated magnetic core. 4,153,898, Cl. 340-396.000.
La Rocco, Lawrence. Adaptor for machine tool fixture. 4,153,239, Cl. 269-287.000.
Larsen, James L.: *See—*
Gatzke, Ronald D.; Larsen, James L.; and Simons, Elliott S., 4,153,049, Cl. 128-419.00D.
Lassen, Niels: *See—*
Buus, Jorn L. M.; and Lassen, Niels, 4,153,694, Cl. 424-247.000.
Lassine, Guy. Fastening plug. 4,152,968, Cl. 85-71.000.
Latsch, Reinhard: *See—*
Bianchi, Valerio; and Latsch, Reinhard, 4,153,013, Cl. 123-32.0EA.
Lau, Chun-Lim; and Smith, Richard G., to Bell Telephone Laboratories, Incorporated. Temperature compensation circuit. 4,153,835, Cl. 250-214.00C.
Laubenstein, Allan E.; Starich, Donald V.; and Brown, Mitchell L., to General Motors Corporation. Peak cylinder combustion pressure ignition spark timing system. 4,153,019, Cl. 123-117.00R.
Laudenschlarger, W. Philip; Jobe, Richard K.; and Jobe, Richard P., to Meddev Corporation. Light assembly. 4,153,929, Cl. 362-348.000.
Laughlin, David E., to Laughlin Enterprises. Dehydrator. 4,152,842, Cl. 34-196.000.
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Lautenschlager, Gerhard, to Karl Lautenschlager KG, Mobelbeschlagfabrik. Over-center hinge. 4,152,811, Cl. 16-164.000.
Lauterberg, Werner; Steinmetzer, Herbert; Weber, Brigitte; Haack, Dieter; and Taube, Werner, to VEB Leuna-Werke "Walter Ulbricht". Process for working additive into polymers, particularly polymers which can be foamed. 4,153,762, Cl. 521-53.000.
Lautrette, Jean-Claude, to Societe Nouvelle des Filtres Philippe. Method and apparatus for the continuous filtration of material impregnated with liquid. 4,153,550, Cl. 210-66.000.
Lawrence, Jackson, to Cluett, Peabody & Co., Inc. Ammonia processing of fabrics. 4,152,907, Cl. 68-5.00D.
Lazzarini, Louis P., to Genevieve I. Hanscom, Robert Magnuson and Lois J. Thompson, as Trustees of the Estate of Roy M. Magnuson, part interest to each. Stemming and peeling apparatus. 4,152,977, Cl. 99-640.000.
Lea, Bernard A., to Minnesota Mining and Manufacturing Company. Photothermographic emulsions containing magenta acutance dyes. 4,153,463, Cl. 96-114.100.
Lear Siegler, Inc.: *See—*
Cook, James E., 4,153,393, Cl. 417-429.000.
Lectromelt Corporation: *See—*
Persson, John A., 4,153,812, Cl. 13-12.000.
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Audibert, Francoise; Chedid, Louis; Lefrancier, Pierre; Choay, Jean; and Lederer, Edgar, 4,153,684, Cl. 424-88.000.
Ledex, Inc.: *See—*
Coors, George T., 4,153,890, Cl. 335-260.000.
Lee, Thomas B. K.: *See—*
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,153,790, Cl. 544-161.000.
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,153,791, Cl. 544-161.000.
Lee, Yat-Shir: *See—*
Little, Michael J.; Garvin, Hugh L.; and Lee, Yat-Shir, 4,153,529, Cl. 204-192.0EC.
Leenhouts, Albert C., to Superior Electric Company, The. Pulse to step stepping motor control circuit. 4,153,866, Cl. 318-696.000.
Lefevre, Robert A. & Dorthy J.: *See—*
Willis, William M., 4,153,003, Cl. 116-268.000.
Le Floch, Gerard: *See—*
Mircovich, Jean-Louis; Macaire, Marcel; Charlas, Rene; and Le Floch, Gerard, 4,153,827, Cl. 200-144.00B.
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Audibert, Francoise; Chedid, Louis; Lefrancier, Pierre; Choay, Jean; and Lederer, Edgar, 4,153,684, Cl. 424-88.000.
Legal, Casimer C., Jr.: *See—*
Guithues, William L.; and Legal, Casimer C., Jr., 4,153,441, Cl. 71-34.000.
Legg, Ernest L.: *See—*
Batchelor, Philip J.; and Legg, Ernest L., 4,153,241, Cl. 271-4.000.
Legille, Edouard; and Metz, Paul, to Paul Wurth S.A. Treatment of metallurgical slag. 4,153,440, Cl. 65-19.000.
Leibmann, Bernd: *See—*
Heise, Hartmut; Leibmann, Bernd; Morler, Dieter; Ritter, Eberhard; and Sahm, Wilfried, 4,153,798, Cl. 548-305.000.
Leigh, Kay K., to Johannah Medical Services, Inc. Disposable slide-step percutaneous transhepatic cholangiography procedure tray. 4,153,160, Cl. 206-370.000.
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Leikin, Roman S.: *See—*
Kulberg, Anton Y.; Kalnin, Robert K.; Ioffe, Benyamin A.; Litvinenko, Semen K.; and Leikin, Roman S., 4,153,151, Cl. 198-456.000.
Leininger, Donald B.: *See—*
United States of America, National Aeronautics and Space Administration; Goodloe, Radford R.; Toole, Pierce C.; Belt, Jerry L.; and Leininger, Donald B., 4,153,818, Cl. 179-27.0CA.
Lemburg, Jorn-Uwe; and Stolley, Dieter, to E.C.H. WILL (GmbH & Co.). Apparatus for severing and deforming the ends of helical binders for pads or the like. 4,153,081, Cl. 140-92.700.
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Lents, Charles M. Method for displaying and maintaining precooked food in a moist condition at a suitable serving temperature. 4,153,736, Cl. 426-302.000.
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Leonard, Byron H., Jr., to Bechtel International Corporation. Clamping and welding a pipe joint. 4,153,194, Cl. 228-29.000.
Leonard, Robert E.; and Rhodes, Donald E., to Kerr-McGee Corporation. Use of deashed coal as a flushing agent in a coal deashing process. 4,153,538, Cl. 208-177.000.
Leonard, Willie B. Fluidic repeater. 4,152,971, Cl. 91-388.000.
Leonardi, Samuel. Fishhooks. 4,152,860, Cl. 43-37.000.
Leppmeier, Franz: *See—*
Horn, Peter; Leppmeier, Franz; Eckert, Guenter; and Fischer, Karl, 4,153,784, Cl. 528-338.000.
Leschonski, Kurt: *See—*
Rumpf, Hans; Maly, Karl; and Leschonski, Kurt, 4,153,541, Cl. 209-143.000.
Lever Brothers Company: *See—*
van den Brom, Guido C., 4,153,569, Cl. 252-109.000.
Levine, Richard: *See—*
Leogrande, John A.; and Levine, Richard, 4,153,386, Cl. 415-115.000.
Lewellyn, Morris E.: *See—*
Wang, Samuel S.; and Lewellyn, Morris E., 4,153,549, Cl. 210-54.000.
Lewis, Charles W.: *See—*
Cherenko, Joseph; and Lewis, Charles W., 4,153,526, Cl. 204-159.210.
Lewis, Mack A.; and Greive, Don A., to Wilson Trailer Company. Ramp leg guard. 4,153,289, Cl. 296-24.00C.
Lewis, Robert L. Multiple shutter digital device. 4,152,853, Cl. 40-451.000.
Li, George S.; and Jones, John F., to Standard Oil Company, The. Thermoplastic nitrile resin blends. 4,153,648, Cl. 260-896.000.
Libit, Sidney M. Pouring closure for liquids. 4,153,175, Cl. 215-253.000.
LiDonnici, Kenneth. Device for increasing diameter of a pulley. 4,152,948, Cl. 74-230.160.
Lieber, Victor. Swimming pool debris collection apparatus. 4,152,801, Cl. 15-1.700.
Lietar, Christian; and Jeannin, Pierre, to Robert Bosch GmbH. Method and devices for localizing flat chips on a carrier plate. 4,153,367, Cl. 356-400.000.
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Marino, Frank P.; and Light, Evert P., 4,153,008, Cl. 118-634.000.
Light, Gordon S.: *See—*
Green, Wendel C.; Cunningham, Russell E.; Light, Gordon S.; Sharkitt, Patrick J.; and Webster, Charles W., 4,153,931, Cl. 364-200.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Process of enhancing the aroma of a soap with norbornane derivatives. 4,153,568, Cl. 252-108.000.
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Lim, Chong C., to RCA Corporation. Self-regulating deflection circuit with resistive diode biasing. 4,153,862, Cl. 315-408.000.
Lim Holding, S.A.: *See—*
Schmidt, Oskar; and Sibral, Walter, 4,153,801, Cl. 548-312.000.
Lincoln, Richard G. Method of producing mushroom spawn. 4,152,868, Cl. 47-1.100.
Lindh, K. Gosta, to Atlas Copco Aktiebolag. Device for detecting leakage in hydraulic systems. 4,152,925, Cl. 73-40.50R.
Lindo, Neil A.: *See—*
Zinnes, Harold; and Lindo, Neil A., 4,153,711, Cl. 424-273.00P.
Lingenfelter, Allen C.: *See—*
Eiselstein, Herbert L.; and Lingenfelter, Allen C., 4,153,455, Cl. 75-171.000.
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Anderson, David; Brown, Kenneth R.; and Linklater, William L., 4,152,942, Cl. 74-5.00R.
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Wirt, Leslie S., 4,152,895, Cl. 60-398.000.
Lockheed Petroleum Services, Ltd.: *See*—
Hopkins, John W.; and Sellars, Claude A., 4,153,113, Cl. 166-356.000.
Loeliger, Arnold E., to Aerosol Service, A.G. Pressurized dispensing container with liner. 4,153,182, Cl. 222-95.000.
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Erfeling, Arthur, 4,153,010, Cl. 119-52.0AF.
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Hennemann, Manfred; Lohr, Albrecht; and Krings, Peter, 4,153,570, Cl. 252-121.000.
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Shumakov, Valery I.; and Lokshin, Moisei A., 4,152,785, Cl. 3-1.700.
Long, John V.: *See*—
Gagliani, John; and Long, John V., 4,153,783, Cl. 528-337.000.
Longinotti, Enrico. Equipment for filling molds with colored mortars and with the aid of partitions to define patterns on the visible surface. 4,153,401, Cl. 425-134.000.
Longoni, Sergio, to Industrie Pirelli Societa per Azioni. Sheathed optical fiber element and cable. 4,153,332, Cl. 350-96.230.
Longsworth, Ralph C., to Air Products and Chemicals, Inc. Bimaterial demand flow cryostat. 4,152,903, Cl. 62-222.000.
Lord Corporation: *See*—
Ferralli, Michael W., 4,153,136, Cl. 181-252.000.
L'Oreal: *See*—
Lang, Gerard, 4,153,065, Cl. 132-7.000.
Lorenz, Peter: *See*—
Borggrefe, Gerhard; Moller, Hinrich; Lorenz, Peter; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,153,726, Cl. 424-313.000.
Los, Mechislav N.: *See*—
Tyavlovsky, Mikhail D.; Kundas, Semen P.; Los, Mechislav N.; Serenkov, Valentin J.; and Vyshinsky, Nikolai V., 4,152,914, Cl. 72-38.000.
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White, John T.; and Lovelady, Kenneth T., 4,153,901, Cl. 346-75.000.
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Lowrey, Dean R.: *See*—
Maffitt, Kent N.; Brueckner, Hubert U.; and Lowrey, Dean R., 4,153,654, Cl. 264-1.000.
Lucas Industries Limited: *See*—
Fenne, Ivor, 4,153,200, Cl. 239-94.000.
Ludoph, Hemmo H. J.: *See*—
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Luke, Robert R., to Cameron Iron Works, Inc. Flex joint. 4,153,112, Cl. 166-355.000.
Lund, Lloyd W. Razor having variable angle and tilt of its blade. 4,152,828, Cl. 30-89.000.
Lundberg, George A., to E. J. Brooks Company. Lock. 4,152,909, Cl. 70-34.000.
Lundberg, Robert D.: *See*—
Makowski, Henry S.; Klein, Robert R.; and Lundberg, Robert D., 4,153,588, Cl. 260-23.50A.
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Beiter, Charles B.; and Hafner, Leroy A., 4,153,574, Cl. 252-316.000.
Maag Gear-Wheel Machine Company Limited: *See*—
Sigg, Hans, 4,153,002, Cl. 115-900.000.
Maatschappij Van Berkel's Patent N.V.: *See*—
Engels, Mathijs M. J.; and Devoogd, Albert H., 4,153,122, Cl. 177-25.000.
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MacKenzie, Burton T., Jr.; Prober, Maurice; and Kiersztyn, Stanley E., to General Electric Company. Dielectric insulating polyolefin compounds and conductor products insulated therewith. 4,153,752, Cl. 428-379.000.
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Matsui, Hidefumi; Tomioka, Kenichi; Kawada, Hiroitsu; and Maeno, Hiroo, 4,153,727, Cl. 414-317.000.
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Hammel, Harold T.; and Maggert, James E., 4,153,546, Cl. 210-41.000.
Magielka, Stanislaw: *See*—
Brzozowski, Zdzislaw; Magielka, Stanislaw; Angielski, Stefan; Janicki, Stanislaw; Wojcikowski, Czeslaw; and Jakubowski, Zenon, 4,153,710, Cl. 424-273.00P.
Magnavox Company, The: *See*—
Poppa, Rocco, 4,153,887, Cl. 333-172.000.
Magrini, Fabio, to Cleveland Clinic Foundation. Thermodilution catheter and method. 4,153,048, Cl. 128-692.000.
Mahabir, Vanda J., to Raymond Lee Organization, Inc. Billfold and small item holder. 4,153,093, Cl. 150-35.000.
Mahr, Rene N.; and Cimenti, Giovanni, to S.A. des Anciens Etablissements Paul Wurth. Lubrication technique and apparatus. 4,153,140, Cl. 184-6.000.
Mahr, Robert J.: *See*—
Dadowski, Gilbert F.; Mahr, Robert J.; and Drachman, Stanley P., 4,152,986, Cl. 101-463.000.
Maki, Hideo; Hosokawa, Takanori; and Shinbo, Katsutoshi, to Hitachi, Ltd. Method of starting operation of a nuclear reactor. 4,153,506, Cl. 176-20.00R.
Makowski, Henry S.; Klein, Robert R.; and Lundberg, Robert D., to Exxon Research & Engineering Co. Metal neutralized sulfonated EPDM terpolymers and compositions thereof. 4,153,588, Cl. 260-23.50A.
Malakian, Vahe H.: *See*—
Sapino, Anthony P.; Swatik, Donald S.; Costello, Robert E.; Malakian, Vahe H.; and Staugaard, Kenneth, 4,152,981, Cl. 101-93.010.
Malinowski, Eugene F., to D. A. B. Industries, Inc. Clutch with replacable disc and motor assemblies. 4,153,148, Cl. 192-87.170.
Mallan, George M.: *See*—
Garrett, Donald E.; and Mallan, George M., 4,153,514, Cl. 201-2.500.
Maly, Karl: *See*—
Rumpf, Hans; Maly, Karl; and Leschonski, Kurt, 4,153,541, Cl. 209-143.000.
Mamon, Glenn; Youmans, Douglas G.; and Volp, Jeffrey A., to Charles Stark Draper Laboratory, Inc., The. Rangefinding system. 4,153,366, Cl. 356-5.000.
Mann, Karlheinz: *See*—
Edelmann, Hermann; Kraft, Peter; Mann, Karlheinz; Schuler, Peter; and Hagen, Alexander, 4,153,513, Cl. 195-103.50R.
Mannesmann Aktiengesellschaft: *See*—
Hellmund, Wolfgang; Krug, Gerhard; Missaire, Gerhard; Roether, Kurt; and Schatton, Paul, 4,153,283, Cl. 285-334.000.
Hendrischk, Wolfgang, 4,152,962, Cl. 83-482.000.
Vorbach, Emil, 4,152,917, Cl. 72-189.000.
Mannhart, Werner, to Zellweger, Ltd. Method and apparatus for evaluating yarn signals having an at least approximately periodic component. 4,152,931, Cl. 73-160.000.
Maraschin, Norma J.: *See*—
Karol, Frederick J.; Wu, Chisung; Reichle, Walter T.; and Maraschin, Norma J., 4,153,576, Cl. 252-428.000.
Marc, Michel, to Clint, Inc. Puzzle. 4,153,254, Cl. 273-160.000.
Marceau, Daniel J.; and Moriarty, Robert M., to United Technologies Corporation. Balanced control waveform for reducing inverter harmonics. 4,153,930, Cl. 363-42.000.
Marcotte, Dennis, to Western Irrigation and Manufacturing, Inc. Pipeline drive system. 4,153,070, Cl. 137-344.000.
Marinaga Engineering Co. Ltd.: *See*—
Okada, Katsuto; Yamamoto, Hideo; Teraguchi, Susumu; and Ishibashi, Norio, 4,153,544, Cl. 210-12.000.
Marino, Frank P.; and Light, Evert P., to Interrad Corporation. Moving filter system for air-powder separation in an electrostatic powder spray system. 4,153,008, Cl. 118-634.000.
Marion, Thomas E., to Universal Machine Co., Inc. Magnetic feeding device. 4,153,190, Cl. 226-33.000.
Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,153,595, Cl. 260-45.70S.
Markem Corporation: *See*—
Swift, Kenneth J., 4,153,496, Cl. 156-384.000.
Markfelder, Gunter; and Hofmann, Heinrich, to Kugelfischer Georg Schafer & Co. Shoulderless roller bearing. 4,153,309, Cl. 308-217.000.
Markle, Larry M.: *See*—
Sherwood, Edward F.; and Markle, Larry M., 4,153,234, Cl. 256-69.000.
Marlin, Louis A., to Interlake, Inc. Stabilized fuel slurry. 4,153,421, Cl. 44-51.000.
Marquis, Francois: *See*—
Espitalie, Jean; Laporte, Jean-Loup; Madec, Marcel; and Marquis, Francois, 4,153,415, Cl. 23-230.0EP.

Marrington, Jack D., to J. D. Engineering Services Pty. Ltd. Metering dispenser for liquids. 4,153,187, Cl. 222-440.000.

Marsh, Daniel G., to United States of America, Army. Method of removing foulants from ion exchange resins. 4,153,761, Cl. 521-26.000.

Marsh Stencil Machine Co., The: *See*—
Hill, Forrest G., 4,153,046, Cl. 126-390.000.

Martin, John R. Dancer assembly. 4,153,218, Cl. 242-75.300.

Martinez, Ginez, to Salanon S.A. Automatically interlockable hinge. 4,152,810, Cl. 16-144.000.

Maruoka, Hiroyuki: *See*—
Nagaishi, Hatsuo; and Maruoka, Hiroyuki, 4,152,935, Cl. 73-194.00F.

Marvin Glass & Associates: *See*—
Baer, Ralph H., 4,153,821, Cl. 179-100.40D.

Marx, Anton: *See*—
Huber, Wolfgang; and Marx, Anton, 4,153,258, Cl. 277-56.000.

Masaki, Chiharu: *See*—
Koide, Tohru; Ezawa, Tabashi; Onoda, Hideki; Masaki, Chiharu; and Morita, Tohru, 4,153,766, Cl. 526-59.000.

Maschinenbau Greene GmbH & Co KG: *See*—
Schulze, Wilhelm, 4,153,215, Cl. 242-56.00A.

Masco Corporation of Indiana: *See*—
Fathauer, George H.; and Holst, Wayne L., 4,153,877, Cl. 325-25.000.

Masek, Karel: *See*—
Imler, Jacques; and Masek, Karel, 4,153,083, Cl. 141-4.000.

Mashimo, Yukio: *See*—
Ikawa, Kazuo; Hirohata, Michio; Matsuda, Mutsuhide; and Mashimo, Yukio, 4,153,355, Cl. 354-33.000.

Maskin AB N.A. Eie: *See*—
Nilsmar, Nils O., 4,152,800, Cl. 15-1.700.

Massachusetts Institute of Technology: *See*—
Dennis, Jack B.; and Misunas, David P., 4,153,932, Cl. 364-200.000.

Massey-Ferguson Services N.V.: *See*—
Quick, Donald J., 4,152,883, Cl. 56-13.900.

Masu, Masanobu: *See*—
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, 4,153,644, Cl. 260-876.00B.

Materniak, Gizela, nee Balcerowicz; and Materniak, Zdzislaw. Exhaust system for laundry dryer. 4,152,844, Cl. 34-235.000.

Materniak, Zdzislaw: *See*—
Materniak, Gizela, nee Balcerowicz; and Materniak, Zdzislaw, 4,152,844, Cl. 34-235.000.

Mathuda, Yoshimi: *See*—
Iwahana, Keiichi; Mathuda, Yoshimi; and Futamura, Kenichiro, 4,153,756, Cl. 428-653.000.

Matsuda, Akio, to Director-General of the Agency of Industrial Science and Technology. Cobalt pyridyl catalysts for hydroformylation. 4,153,795, Cl. 546-2.000.

Matsuda, Mutsuhide: *See*—
Ikawa, Kazuo; Hirohata, Michio; Matsuda, Mutsuhide; and Mashimo, Yukio, 4,153,355, Cl. 354-33.000.

Matsui, Hidefumi; Tomioka, Kenichi; Kawada, Hiroitsu; and Maeno, Hiroo, to Yamanouchi Pharmaceutical Co., Ltd. Pharmaceutical compositions of a prostaglandin compound for rectal use in treating asthma. 4,153,727, Cl. 414-317.000.

Matsushima, Tatsuo: *See*—
Fujimoto, Shoji; and Matsushima, Tatsuo, 4,152,930, Cl. 73-136.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,153,484, Cl. 148-32.000.
Minakuchi, Hiroshi, 4,153,864, Cl. 318-341.000.

Matsuzawa, Tai: *See*—
Hirai, Shin-Ichiro; Ikenaga, Toshiaki; and Matsuzawa, Tai, 4,153,689, Cl. 424-178.000.

Matthews, William G.; and Shaw, Herbert C., to Union Carbide Corporation. Selective adsorption of NO_x from gas streams. 4,153,429, Cl. 55-68.000.

Mattuck, Morris: *See*—
Sack, Stanley F.; and Mattuck, Morris, 4,153,492, Cl. 156-172.000.

Maurer, Andreas: *See*—
Naegeli, John P.; and Maurer, Andreas, 4,153,388, Cl. 416-61.000.

Maximovich, Michael J.: *See*—
Burroway, Gary L.; and Maximovich, Michael J., 4,153,592, Cl. 260-29.60N.

Maxton Manufacturing Company: *See*—
Risk, Daniel W., 4,153,074, Cl. 137-596.120.

Mayer, Manfred: *See*—
Lenk, Erich; Mayer, Manfred; and Munnekehoff, Gerd, 4,153,211, Cl. 242-35.50A.

Mayeux, Christian, to Compagnie Generale de Radiologie. Scintillation-type X-ray detector and radiology apparatus incorporating such detector. 4,153,838, Cl. 250-368.000.

Mayo, John H. Sub-sea equipment test and isolation tool. 4,152,924, Cl. 73-40.50R.

McCall, John M., to Upjohn Company, The. 2-Benzoxepins. 4,153,612, Cl. 260-333.000.

McCarthy, Harry E.; and French, Gordon B., to Occidental Oil Shale, Inc. Removal of pillars from a void for explosive expansion toward the void. 4,153,298, Cl. 299-2.000.

McCarty, Leslie P., to Dow Chemical Company, The. Deuterated analogues of methoxyflurane useful as an anesthetic. 4,153,636, Cl. 568-684.000.

McColl, Bruce J., to Owens-Illinois, Inc. Off-road vehicle. 4,153,265, Cl. 280-112.00A.

McCoy, Kenneth H. Game of physical skill. 4,153,245, Cl. 273-1.00R.

McCrae, James M.: *See*—
Chamberlain, Terence R.; Campbell, Colin D.; and McCrae, James M., 4,153,601, Cl. 546-7.000.

McCune, William J., Jr.: *See*—
Dietz, Milton S.; and McCune, William J., Jr., 4,153,362, Cl. 354-293.000.

McDonald, Bernard. Solar energy collecting system. 4,153,038, Cl. 126-270.000.

McDonald, Edward L. Level indicating device. 4,152,839, Cl. 33-366.000.

McDonough Manufacturing Company: *See*—
Detjen, Robert K., 4,152,960, Cl. 83-435.200.

McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., to American Hoechst Corporation. 4-Benzyloxy-3-(benzyloxy carbonyl)phenylthioacetmorpholide. 4,153,790, Cl. 544-161.000.

McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., to American Hoechst Corporation. 3-Carboxy-4 hydroxyphenylthioacetmorpholide. 4,153,791, Cl. 544-161.000.

McGalliard, James D. Nylon hose treated with microencapsulated hair dissolving solution. 4,152,784, Cl. 2-239.000.

McGee, James P.: *See*—
Bissett, Larry A.; Friggens, Gary R.; and McGee, James P., 4,153,427, Cl. 48-86.00R.

McGraw-Edison Company: *See*—
Moran, Richard J., 4,153,924, Cl. 361-94.000.

McKay, Dwight L., to Phillips Petroleum Company. Cracking with catalyst modified by antimony thiophosphate. 4,153,536, Cl. 208-120.000.

McKechnie, John C., to United States of America, Navy. Optical image modifier for distortion or other compensation. 4,153,915, Cl. 358-213.000.

McKenzie, Ross A. Sectional tire. 4,153,094, Cl. 152-334.000.

McLean, John O. Use of acidified copper sulfate in hydrogen sulfide removal. 4,153,547, Cl. 210-48.000.

McLeod, John S., to Interpace Corporation. Polyurethane foam body with alkaline substance suspended therein for protecting pipe joints of small-diameter pipes. 4,153,261, Cl. 277-205.000.

McLeod, Murray R.: *See*—
von der Heide, Jack; Edelman, Robert J.; and McLeod, Murray R., 4,153,554, Cl. 210-96.00M.

McNeil, Roderick J.; and Hutchins, Burleigh M., to Waters Associates, Inc. Pneumatic valve apparatus. 4,153,076, Cl. 137-624.110.

McNutt, William J., to General Electric Company. Transient voltage distribution improving line shield for layer wound power transformer. 4,153,891, Cl. 336-70.000.

McWhorter, Edward M. Engine compound crankshaft. 4,152,955, Cl. 74-602.000.

Mears, Donald B., Jr. Carburetion by evaporation and osmosis. 4,153,651, Cl. 261-55.000.

Meddev Corporation: *See*—
Laudenschlarger, W. Philip; Jobe, Richard K.; and Jobe, Richard P., 4,153,929, Cl. 362-348.000.

Medipolar Oy: *See*—
Lamminkari, Eero K.; and Koskenniska, Lasse A., 4,153,622, Cl. 260-397.250.

Medkeff, Arthur T.: *See*—
Nye, Norman H., 4,153,186, Cl. 222-378.000.

Meggyesy, Joseph. Prosthetic knee joint having weight responsive brake. 4,152,787, Cl. 3-27.000.

Meier, Joseph F.: *See*—
Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,153,740, Cl. 427-8.000.

Meijer, Albert J.; and Rentema, Albertus P., to U.S. Philips Corporation. Hair-cutting. 4,152,830, Cl. 30-195.000.

Meiji Nyugyo Kabushiki Kaisha: *See*—
Kawasaki, Koichiro; Okada, Kazushige; Suginaka, Yutaka; Adachi, Tokuichi; and Shirasu, Akira, 4,152,976, Cl. 99-450.100.

Meiller, Hermann; and Kunst, Otto, to Messrs. Willibald Grammer. Apparatus for adjusting the inclination of seat upholstery in a driver's seat, office chair, revolving armchair or the like. 4,153,294, Cl. 297-284.000.

Melcher, Franz J.: *See*—
Knothe, Erich; Berg, Christoph; and Melcher, Franz J., 4,153,124, Cl. 177-210.0EM.

Melvin, Myron F.: *See*—
Berry, Bernie B., Jr.; and Melvin, Myron F., 4,152,854, Cl. 40-610.000.

Mendenhall, Robert L. Process for treating exhaust gaseous mixtures from directly exposing asphalt-aggregate compositions to hot gases. 4,153,471, Cl. 106-281.00R.

Menelly, Richard A.: *See*—
Kresge, James S.; and Menelly, Richard A., 4,153,921, Cl. 361-40.000.

Menig, John B. Taper candle fabrication apparatus. 4,153,007, Cl. 118-101.000.

Merck & Co., Inc.: *See*—
Atkinson, Joseph G.; Rooney, Clarence S.; Girard, Yves; and Engelhardt, 4,153,715, Cl. 424-274.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Gericke, Rolf; Rogalski, Werner; Bergmann, Rolf; Hameister, Walter; and Wahlig, Helmut, 4,153,693, Cl. 424-246.000.
Kobel, Erich, 4,153,057, Cl. 128-272.100.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Weiland, Emil, 4,153,390, Cl. 416-138.000.
Messing, Ralph A.; and Oppermann, Robert A., to Corning Glass Works. High surface low volume biomass composite. 4,153,510, Cl. 195-59.000.
Messner, Eric J.; and Dornbush, Albert C., to Fisher Scientific Company. Storage stable antibiotic susceptibility test kit and method of testing. 4,153,512, Cl. 195-103.50K.
Messrs. Willibald Grammer: *See—*
Meiller, Hermann; and Kunst, Otto, 4,153,294, Cl. 297-284.000.
Metal Box Limited: *See—*
Webster, George, 4,152,997, Cl. 113-24.00R.
Metallgesellschaft Aktiengesellschaft: *See—*
Gerken, Rudolf; Guth, Hans; Mucke, Christoph; Potes, Willi; and Wieschen, Hermann, 4,153,628, Cl. 423-531.000.
Methlie, Jan E., to General Electric Company. Auxiliary oil supply system. 4,153,141, Cl. 184-6.200.
Metz, Paul: *See—*
Legille, Edouard; and Metz, Paul, 4,153,440, Cl. 65-19.000.
Metzger, Kirk J.: *See—*
Bercik, Paul G.; Swift, Harold E.; and Metzger, Kirk J., 4,153,638, Cl. 585-526.000.
Meyenburg, Ingeborg, heir: *See—*
Jungfer, Leopold, deceased; Jungfer, Helmut, heir; Meyenburg, Ingeborg, heir; Kautschitsch, Dieter; and Weber, Richard, 4,153,867, Cl. 320-43.000.
Meyer, Alfred: *See—*
Drabek, Jozef; and Meyer, Alfred, 4,153,723, Cl. 424-304.000.
Meyer, Hermann: *See—*
Boehn, Hugo; Treptow, Wolfram; Wunsch, Gerd; Kiener, Volker; Meyer, Hermann; and Csizi, Gotthard, 4,153,742, Cl. 427-126.000.
Meyer, Juergen, to Heimann GmbH. Photosensitive matrix with substrate. 4,153,908, Cl. 357-32.000.
Meyer, Larry P., to Nelson Irrigation Corporation. Part-circle sprinkler head with improved quick-return mechanism. 4,153,202, Cl. 239-230.000.
Meyer, Robert: *See—*
Duchene, Jacques; and Meyer, Robert, 4,153,345, Cl. 350-363.000.
Micro Power Systems: *See—*
Hall, John H., 4,152,823, Cl. 29-571.000.
Microdot, Inc.: *See—*
Kukla, Frank A., 4,153,324, Cl. 339-97.00R.
Miedema, Hotze, to Bell Telephone Laboratories, Incorporated. Ninety degree phase stepper. 4,153,886, Cl. 333-156.000.
Mikami, Masao: *See—*
Shiozaki, Hiroyuki; and Mikami, Masao, 4,152,912, Cl. 72-10.000.
Mikoshiba, Hitoshi; and Tezuka, Chikao, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Miniature printer. 4,152,982, Cl. 101-93.220.
Miley, John W.: *See—*
Kluger, Edward W.; Miley, John W.; and Su, Tien K., 4,153,567, Cl. 252-51.50A.
Miller, Harold N.: *See—*
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., 4,153,566, Cl. 252-51.50A.
Miller, Wesley T. Animal trap holder. 4,152,861, Cl. 43-88.000.
Millhimes, Wayne L.: *See—*
Dittmann, Larry E.; Millhimes, Wayne L.; and Steinhauer, Glenn A., 4,153,406, Cl. 425-438.000.
Milliken Research Corporation: *See—*
Kluger, Edward W.; Miley, John W.; and Su, Tien K., 4,153,567, Cl. 252-51.50A.
Mills, Daniel J. Flush tank water saver. 4,152,793, Cl. 4-325.000.
Minakawa, Tadashi: *See—*
Suzuki, Yoshihiro; Minakawa, Tadashi; and Asai, Osamu, 4,153,519, Cl. 204-40.000.
Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Motor speed regulator. 4,153,864, Cl. 318-341.000.
Minami, Masana; and Sekizawa, Hidekazu, to Tokyo Shibaura Electric Co., Ltd. Optimized spatial filter for defect detection. 4,153,336, Cl. 350-162.0SF.
Minnesota Mining and Manufacturing Company: *See—*
Bailey, Terry R., 4,153,412, Cl. 8-2.50A.
Ferguson, Alan N., 4,153,505, Cl. 162-164.00R.
Fravel, Ralph P.; and Godec, Ciril J., 4,153,059, Cl. 128-422.000.
Kellie, Truman F., 4,153,457, Cl. 96-27.00H.
Lea, Bernard A., 4,153,463, Cl. 96-114.100.
Maffitt, Kent N.; Brueckner, Hubert U.; and Lowrey, Dean R., 4,153,654, Cl. 264-1.000.
Ree, Buren R.; Errede, Louis A.; Jefson, Gary B.; and Langager, Bruce A., 4,153,661, Cl. 264-120.000.
Seemann, Ronald W.; and Bradshaw, Thomas I., 4,153,156, Cl. 206-219.000.
Weavers, Mark W., 4,153,178, Cl. 220-306.000.
Minnick, Leonard J.; Webster, William C.; and Smith, Charles L. Products from molten fly ash and scrubber sludge including fly ash. 4,153,655, Cl. 264-8.000.
Minolta Camera Kabushiki Kaisha: *See—*
Uesugi, Kyozo, 4,153,340, Cl. 350-252.000.
Yamada, Seiji, 4,153,358, Cl. 354-106.000.
Minsky Radiotekhnichesky Institut: *See—*
Tyavlovsky, Mikhail D.; Kundas, Semen P.; Los, Mechislav N.; Serenkov, Valentin J.; and Vyshinsky, Nikolai V., 4,152,914, Cl. 72-38.000.
Mircovich, Jean-Louis; Macaire, Marcel; Charlas, Rene; and Le Floch, Gerard, to Gerin, Merlin. Magnetic blow-out arc extinguishing device. 4,153,827, Cl. 200-144.00B.
Missaire, Gerhard: *See—*
Hellmund, Wolfgang; Krug, Gerhard; Missaire, Gerhard; Roether, Kurt; and Schatton, Paul, 4,153,283, Cl. 285-334.000.
Misunas, David P.: *See—*
Dennis, Jack B.; and Misunas, David P., 4,153,932, Cl. 364-200.000.
Mitin, Ivan P.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Baba, Toshihiko; Uomori, Akiyoshi; and Tsuchitani, Tadayasu, 4,153,830, Cl. 219-101.000.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, 4,153,644, Cl. 260-876.00B.
Mitsubishi Paper Mills, Ltd.: *See—*
Iguchi, Shigeru; Iwata, Tamotu; and Yano, Tetsuo, 4,153,458, Cl. 96-67.000.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Yui, Hiroshi, 4,153,587, Cl. 260-23.00H.
Mitsui Engineering and Shipbuilding Co., Ltd.: *See—*
Oshima, Masanao; Tabuchi, Hiroshi; and Inokawa, Tsuneo, 4,152,999, Cl. 114-42.000.
Mittelhauser, Bernhard. Side view mirror with inverting spindle. 4,153,342, Cl. 350-289.000.
Miwa, Hirohide; Oikawa, Kiyoshi; and Iizuka, Yoshio, to Fujitsu Limited. Facsimile communication system and method. 4,153,916, Cl. 358-257.000.
Miyasaka, Kenzi: *See—*
Namiki, Ryo; and Miyasaka, Kenzi, 4,152,888, Cl. 58-58.000.
Miyazaki, Seiichi, to Ohkura Electric Co. Ltd. Receiver circuit. 4,153,848, Cl. 307-268.000.
Mizuma, Kenichi, to Ricoh Company, Ltd. Sheet feed apparatus. 4,153,242, Cl. 271-9.000.
Mobil Oil Corporation: *See—*
Braid, Milton, 4,153,563, Cl. 252-47.000.
Braid, Milton; and Landis, Phillip S., 4,153,565, Cl. 252-51.50A.
Chibnik, Sheldon, 4,153,564, Cl. 252-51.50A.
Gorring, Robert L.; and Smith, Robert L., 4,153,540, Cl. 208-89.000.
Mobil Tyco Solar Energy Corporation: *See—*
Gonsiorawski, Ronald, 4,152,824, Cl. 29-572.000.
Model, Ernst, to Ciba-Geigy Corporation. Isoindolinone pigments. 4,153,800, Cl. 548-305.000.
Modrovich, Ivan E. Stabilized liquid coenzyme compositions. 4,153,511, Cl. 195-99.000.
Moertel, George B.; and Johnston, James R., to Textron Inc. Slide fastener chain with wide gap and method and apparatus for manufacture. 4,153,489, Cl. 156-73.300.
Mohiuddin, Mohammed S. Cockroach extermination apparatus. 4,152,862, Cl. 43-121.000.
Mohrhauer, Hans: *See—*
Coester, Erwin; Krapf, Heinz; Pfistermeister, Martin; Sartor, Bruno; and Mohrhauer, Hans, 4,153,480, Cl. 148-6.350.
Mohri, Katsuo: *See—*
Azuma, Nobuo; Abe, Yuuhei; Mohri, Katsuo; and Yabe, Yuhiko, 4,153,922, Cl. 361-3.000.
Moller, Hinrich: *See—*
Borggrefe, Gerhard; Moller, Hinrich; Lorenz, Peter; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,153,726, Cl. 424-313.000.
Molyneux, Alan: *See—*
de Vleesschauwer, Walter F.; and Molyneux, Alan, 4,153,637, Cl. 585-405.000.
Mommer, Richard P., to Uniscope, Inc. Lubricant-binder additive for densifying animal feed material. 4,153,735, Cl. 426-285.000.
Monahan, Michael A.: *See—*
Catano, Paul S.; Monahan, Michael A.; and Bromley, Keith, 4,153,917, Cl. 360-10.000.
Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr., 4,153,217, Cl. 242-71.800.
Hamisch, Paul H., Jr., 4,153,495, Cl. 156-384.000.
Utzinger, William F., 4,152,984, Cl. 101-292.000.
Monkovic, Ivo; Bachand, Carol; and Wong, Henry, to Bristol-Myers Company. (±)-2-Cyclobutylmethyl-9α,10β-dihydroxy-1β-(p-alkoxy-benzyl)perhydroisoquinoline. 4,153,603, Cl. 546-142.000.
Monolithic Memories Inc.: *See—*
Ghest, Robert C.; Chua, Hua-Thye; and Birkner, John M., 4,153,938, Cl. 364-760.000.
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Cheape, Dudley W., Jr.; and Bankston, Charles E., 4,153,787, Cl. 528-500.000.
Mookherjee, Braja D.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.;

Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
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Moon, Malcolm W., to Upjohn Company, The. Fungicidal isoxazolyl phenols and method of use. 4,153,707, Cl. 424-272.000.

Moore, Jesse C. Fuel induction system for internal combustion engines. 4,153,653, Cl. 261-157.000.

Moran, Richard J., to McGraw-Edison Company. Inrush current restraint circuit for alternating power system switch. 4,153,924, Cl. 361-94.000.

Morgan, Willam A., to Storage Technology Corporation. Time assignment speech interpolation communication system with variable delays. 4,153,816, Cl. 179-15.0AS.

Moriarty, Maurice J.: *See—*
Kumm, Emerson L.; and Moriarty, Maurice J., 4,153,028, Cl. 123-141.000.

Moriarty, Robert M.: *See—*
Marceau, Daniel J.; and Moriarty, Robert M., 4,153,930, Cl. 363-42.000.

Morita, Kazuo, to Nakamura Kinzoku Kogyosho, Inc. Rotary pumps circulating pumped fluid to seal. 4,153,400, Cl. 418-102.000.

Morita, Tohru: *See—*
Koide, Tohru; Ezawa, Tabashi; Onoda, Hideki; Masaki, Chiharu; and Morita, Tohru, 4,153,766, Cl. 526-59.000.

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Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,153,484, Cl. 148-32.000.

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Kawamura, Yoshio; and Moriyama, Shigeo, 4,153,341, Cl. 350-255.000.

Morler, Dieter: *See—*
Heise, Hartmut; Leibmann, Bernd; Morler, Dieter; Ritter, Eberhard; and Sahm, Wilfried, 4,153,798, Cl. 548-305.000.

Morlock, Reuben D., to Haybuster Mfg. Inc. Rock picker with kicker roller. 4,153,114, Cl. 171-65.000.

Morris, Melvyn D., to Addygable Limited. Toothbrush. 4,152,804, Cl. 15-167.00R.

Morris, Willis M.: *See—*
Alderman, Norman H.; and Morris, Willis M., 4,153,163, Cl. 206-610.000.

Mort, Charles B.; and Anthony, Robert E., to United Aircraft Products, Inc. Making mechanical tube joints. 4,152,818, Cl. 29-157.30C.

Motion Analysis, Inc.: *See—*
Plagenhoef, Stanley C., 4,153,249, Cl. 273-73.00C.

Motorola, Inc.: *See—*
Gregory, Vernon C., 4,153,942, Cl. 364-900.000.
Osborn, James L., 4,153,878, Cl. 325-370.000.

Mourier, Jean: *See—*
Grauleau, Didier; Mourier, Jean; Shroff, Arvind; and Villain, Jacques, 4,153,041, Cl. 126-271.000.

MTU Munchen GmbH: *See—*
Weiler, Wolfgang, 4,153,387, Cl. 415-219.00C.

Mucke, Christoph: *See—*
Gerken, Rudolf; Guth, Hans; Mucke, Christoph; Potes, Willi; and Wieschen, Hermann, 4,153,628, Cl. 423-531.000.

Mueller, David C., to Mueller, Donna M. Folding air deflector. 4,153,288, Cl. 296-1.00S.

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Mueller, Harry B., to Burroughs Corporation. Method for separating the ground and signal conductors in a plural conductor flat cable. 4,152,826, Cl. 29-624.000.

Mueller, Helmut, to Sprimag Spritzmaschinenbau GmbH. Center drilling machine. 4,153,382, Cl. 408-10.000.

Mueller, Herbert: *See—*
Graefje, Heinz; Nottes, Guenther; Mueller, Herbert; Daumiller, Guenther; and Hoffmann, Herwig, 4,153,425, Cl. 44-71.000.

Mueller, Karl F., to Ciba-Geigy Corporation. Perfluoroalkyl substituted anhydrides and polyacids, and derivatives thereof. 4,153,590, Cl. 260-29.2EP.

Mueller, Walter A., to Corrosion Service Company Limited. Process for the production of polysulphide pulping liquor from pulp mill recovery smelt. 4,153,502, Cl. 162-17.000.

Muhler, Joseph C.; Kleber, Carl J.; and Kelly, Ray G., to Indiana University Foundation. Anticariogenic comestible. 4,153,732, Cl. 426-72.000.

Muller, Harold H.: *See—*
Rau, John W., III; Muller, Harold H.; Tam, Richard K. W.; and Kabell, Louis J., 4,153,949, Cl. 365-104.000.

Muller, Pierre: *See—*
Warolin, Christian J. M.; Muller, Pierre; and Zaoui, Roger, 4,153,729, Cl. 424-325.000.

Munekata, Seiji: *See—*
Yamabe, Masaaki; Munekata, Seiji; and Samejima, Shunichi, 4,153,804, Cl. 560-183.000.

Munk, Edmund E.: *See—*
Werz, Jakob F.; and Munk, Edmund E., 4,153,490, Cl. 156-85.000.

Munnekehoff, Gerd: *See—*
Lenk, Erich; Mayer, Manfred; and Munnekehoff, Gerd, 4,153,211, Cl. 242-35.50A.

Munters, Carl G., to Aktiebolaget Carl Munters. Method and apparatus for transferring energy in an absorption heating and cooling system. 4,152,901, Cl. 62-112.000.

Murata, Kazuo; Tanso, Shiro; and Yamao, Junzo, to Yuasa Battery Company Limited. Storage battery, separator therefor and method of formation. 4,153,759, Cl. 429-147.000.

Murata, Taneo, to Alps Electric Co., Ltd. Pushbutton switch assembly. 4,153,829, Cl. 200-340.000.

Murayama, Eiichi: *See—*
Hibino, Toshihiko; and Murayama, Eiichi, 4,153,610, Cl. 260-332.20C.

Murayama, Stanley T., to Rhodia, Inc. Process for preparing methyl heptenone from prenyl mesityl oxide using an amine catalyst. 4,153,634, Cl. 260-593.00R.

Murray, William S., Jr.; and Borden, Clarence W., to Goodall Rubber Company. Fire hose and method of making it. 4,153,080, Cl. 138-126.000.

Musil, Vaclav: *See—*
Kubela, Rudolf; Musil, Vaclav; and Hughes, Lise A., 4,153,789, Cl. 544-143.000.

Muther, Richard M., to Environmental Industrial Products. Method for regenerating filters. 4,153,552, Cl. 210-82.000.

Myer, C. Randolph. Eyeglass frames with removable, interchangeable lenses, rims and temple pieces. 4,153,347, Cl. 351-90.000.

Myreen, Bertel, to Ra Shipping Ltd. Oy. Process for wet carbonizing of peat. 4,153,420, Cl. 44-33.000.

Nabisco, Inc.: *See—*
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,153,738, Cl. 426-656.000.

Naegeli, John P.; and Maurer, Andreas, to Sulzer Brothers Limited. Method and apparatus for monitoring the state of oscillation of the blades of a rotor. 4,153,388, Cl. 416-61.000.

Nagaishi, Hatsuo; and Maruoka, Hiroyuki, to Nissan Motor Company, Limited. Mass flow measuring apparatus. 4,152,935, Cl. 73-194.00F.

Nagamune, Yasushi: *See—*
Akaura, Seshiro; Nagamune, Yasushi; and Nakamura, Takeshi, 4,152,798, Cl. 9-8.00R.

Nagano, Masami; and Suzuki, Satosi, to Hitachi, Ltd. Carburetor for stratified charge combustion engine. 4,153,026, Cl. 123-139.0AW.

Nagatsuna, Fumio: *See—*
Hashimoto, Makoto; Tomita, Yoshio; Nagatsuna, Fumio; Hirose, Masateru; and Tanno, Shogo, 4,153,179, Cl. 221-1.000.

Nagel, Hans-Hugo. Process for the preparation of glucoproteins as well as the use thereof. 4,153,686, Cl. 424-176.000.

Nakada, Takashi, to Kyosan Denki Kabushiki Kaisha. Fuel pump. 4,153,394, Cl. 417-571.000.

Nakai, Masanori: *See—*
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,153,487, Cl. 148-175.000.

Nakajima Co., Ltd.: *See—*
Nakajima, Kazunari, 4,153,220, Cl. 242-84.51R.

Nakajima, Kazunari, to Nakajima Co., Ltd. Fishing reel. 4,153,220, Cl. 242-84.51R.

Nakajima, Kohei: *See—*
Ueno, Haruo; Oizumi, Kyohei; Ishikawa, Hideo; Nakajima, Kohei; Tsujimoto, Nobuhiro; Kimura, Osamu; and Aikawa, Hideyuki, 4,153,767, Cl. 526-141.000.

Nakamizo, Keiichi: *See—*
Sato, Masato; and Nakamizo, Keiichi, 4,153,034, Cl. 123-198.00E.

Nakamura, Junichi: *See—*
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,153,487, Cl. 148-175.000.

Nakamura Kinzoku Kogyosho, Inc.: *See—*
Morita, Kazuo, 4,153,400, Cl. 418-102.000.

Nakamura, Takeshi: *See—*
Akaura, Seshiro; Nagamune, Yasushi; and Nakamura, Takeshi, 4,152,798, Cl. 9-8.00R.

Nakamura, Tetsuo: *See—*
Shinoda, Masaichi; Nakamura, Tetsuo; and Yamamoto, Minoru, 4,153,906, Cl. 357-23.000.

Nakano, Yasuaki: *See—*
Yasuda, Michio; Nakano, Yasuaki; Fujisawa, Hiromichi; and Hananoi, Toshihiro, 4,153,897, Cl. 340-146.30Q.

Nakauchi, Hiroshi: *See—*
Hamada, Hiroshi; Nakauchi, Hiroshi; Hishida, Tadanori; and Yano, Kozo, 4,153,344, Cl. 350-357.000.

Nakayama, Hirokazu: *See—*
Ogata, Yuzuru; Kawaguchi, Takeshi; Kinoshita, Ikuya; Nakayama, Hirokazu; and Ukena, Toshinao, 4,153,770, Cl. 526-209.000.

Nakazeki, Tsugito: *See—*
Kimata, Kei; Nakazeki, Tsugito; and Yasuda, Yoshinobu, 4,153,018, Cl. 123-103.00R.

Nalco Chemical Company: *See—*
Clements, Porter; Basila, Michael R.; and Barry, James J., 4,153,671, Cl. 423-244.000.
Forney, Steven W., 4,153,548, Cl. 210-52.000.

Namiki, Ryo; and Miyasaka, Kenzi, to Citizen Watch Co., Ltd. Electronic wrist watch. 4,152,888, Cl. 58-58.000.

Narita, Yoshihiro; Konuma, Hideo; Tagami, Sanae; and Yamada, Hirosi, to Idemitsu Kosan Company Limited. Process for the preparation of polycarbonate with weatherproof property. 4,153,780, Cl. 528-198.000.

National Gypsum Company: *See—*
Burke, William R., 4,152,873, Cl. 52-1.000.

National Patent Development Corp.: *See*—
Tragert, William E., 4,153,042, Cl. 126-271.000.
National Presto Industries, Inc.: *See*—
Tienor, Lawrence J., 4,152,974, Cl. 99-323.800.
National Seed Development Organisation Limited: *See*—
Jones, Owen P., 4,152,869, Cl. 47-58.000.
National Semiconductor Corporation: *See*—
Dobkin, Robert C., 4,153,909, Cl. 357-44.000.
National Starch and Chemical Corporation: *See*—
Tessler, Martin M., 4,153,585, Cl. 260-17.4GC.
Nauta, Constant J. Mixer. 4,153,372, Cl. 366-142.000.
Navratil, Franz, to Siemens Aktiengesellschaft. Method and apparatus for generating a high frequency rotating magnetic field. 4,153,880, Cl. 328-27.000.
Neff-Perkins Company: *See*—
Elly, Robert A.; and Foti, Sam J., 4,153,405, Cl. 425-338.000.
Nehme, Alexander E. Pleural decompression catheter. 4,153,058, Cl. 128-347.000.
Neier, Benjamin R. Feed mixer apparatus. 4,153,376, Cl. 366-298.000.
Nelle, Gunther; and Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Length measuring device. 4,152,837, Cl. 33-125.00C.
Nelson Irrigation Corporation: *See*—
Meyer, Larry P., 4,153,202, Cl. 239-230.000.
Nelson, Thomas L., to Du Pont de Nemours, E. I., and Company. Process for making yarn having alternate sections of greater and less bulk and product thereof. 4,152,886, Cl. 57-208.000.
Nemec, Hans. Electrotherapeutic apparatus. 4,153,061, Cl. 128-420.00A.
Nepsco, Inc.: *See*—
Sheldon, Samuel B., 4,153,293, Cl. 297-284.000.
Nett, Louis A. Backshelf ventilating hood. 4,153,044, Cl. 126-299.00D.
Neuberger, Dan; and Staples, Jon T., to Eastman Kodak Company. Hybrid color photographic elements and processes for developing same. 4,153,459, Cl. 96-73.000.
Neuhauser, Hans J.: *See*—
Beyer, Horst; Neuhauser, Hans J.; and Veutgen, Hans-Jurgen, 4,153,477, Cl. 148-1.000.
Neumann, Rainer; Schwarz, Hans-Helmut; and Arnold, Karl-Heinz, to Haarmann & Reimer GmbH. Process for the preparation of alkyl ethers. 4,153,810, Cl. 568-630.000.
Neumunstersche Maschinen- und Apparatebau Gesellschaft mbH: *See*—
Bauch, Ernst; Kayser, Hans D.; and Peters, Herbert, 4,153,212, Cl. 242-47.000.
Neyret, Guy, to Etablissements Genoud & Cie. Valve for disposable gas lighter. 4,153,233, Cl. 251-127.000.
Nicholson, John S.: *See*—
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 4,153,807, Cl. 562-469.000.
Nihon Radiator Co., Ltd. (Nihon Rajieeta Kabushiki Kaisha): *See*—
Sonoda, Noriaki; and Koike, Kiyoshi, 4,153,106, Cl. 165-174.000.
Niizuma, Akira: *See*—
Ayano, Yukihiko; Yashiro, Kuniji; and Niizuma, Akira, 4,153,479, Cl. 148-6.15Z.
Nikiforov, Anatoly E.: *See*—
Litvak, Rafael S.; Rannev, Georgy G.; Anash, Shulim A.; Kim, Larisa P.; Pen-Chen-Sek, Alexandr I.; Borkov, Gennady E.; Nikiforov, Anatoly E.; Shutchenko, Vladimir G.; and Tabachnikov, Mikhail M., 4,153,521, Cl. 204-105.00R.
Nikolov, Ivan D.: *See*—
Balevski, Angel T.; Nikolov, Ivan D.; and Antonov, Asparuch M., 4,153,100, Cl. 164-155.000.
Nilsmar, Nils O., to Maskin AB N.A. Eie. Sludge suction unit for settling basins. 4,152,800, Cl. 15-1.700.
Nilson, Billy N., to KeNova AB. Package for fluids and a method for producing such a package. 4,153,185, Cl. 222-212.000.
Nippon Electric Co., Ltd.: *See*—
Kudou, Eiichi, 4,153,939, Cl. 364-770.000.
Nippon Rikagakuyakuhin Company, Ltd.: *See*—
Shiba, Kikuo, 4,153,681, Cl. 424-72.000.
Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, 4,153,021, Cl. 123-119.0EC.
Nippon Steel Chemical Co., Ltd.: *See*—
Hayakawa, Akifumi; Aiba, Akira; Orihara, Eiki; and Fukushima, Kiyoshi, 4,153,231, Cl. 249-82.000.
Nishi, Yoshio: *See*—
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,153,487, Cl. 148-175.000.
Nissan Motor Company, Limited: *See*—
Aoyama, Syunichi, 4,152,892, Cl. 60-290.000.
Asano, Masaharu; and Ezoe, Mitsuhiko, 4,153,022, Cl. 123-119.0EC.
Asano, Masaharu; and Hosaka, Akio, 4,153,023, Cl. 123-119.0EC.
Iizuka, Haruhiko, 4,153,033, Cl. 123-198.00F.
Nagaishi, Hatsuo; and Maruoka, Hiroyuki, 4,152,935, Cl. 73-194.00F.
Tanizaki, Hiroyuki; and Shinada, Michio, 4,152,872, Cl. 49-214.000.
Nitto Boseki Co., Ltd.,: *See*—
Araki, Kunio; Sasaki, Takashi; Tabei, Kiyoshi; and Goto, Kazuo, 4,153,525, Cl. 204-159.150.
Nordsiek, Karl-Heinz: *See*—
Schwesig, Helmut; Nordsiek, Karl-Heinz; and Kupper, Friedrich-Wilhelm, 4,153,772, Cl. 526-308.000.
North American Philips Corporation: *See*—
Kok, Pieter W., 4,153,841, Cl. 250-439.00R.
Northern Illinois Research, Inc.: *See*—
Etes, Donald E., 4,153,055, Cl. 128-156.000.
Northern Telecom Limited: *See*—
Johnson, David W., 4,153,327, Cl. 339-205.000.
Olsen, Rolf E., 4,153,819, Cl. 179-84.0VF.
Norton Company: *See*—
Alliegro, Richard A., 4,153,666, Cl. 264-325.000.
Norton, Delwyn E.; and Taylor, Edward W., to United Technologies Corporation. Multiple electron beam vacuum vapor deposition apparatus. 4,153,005, Cl. 118-49.100.
Nosowicz, Eugene J.; and Pearson, Robert C., to International Business Machines Corp. Data bit assembler. 4,153,950, Cl. 365-231.000.
Nosser, Gordon N.: *See*—
Parker, Wallace J.; and Nosser, Gordon N., 4,153,181, Cl. 222-61.000.
Nottes, Guenther: *See*—
Graefje, Heinz; Nottes, Guenther; Mueller, Herbert; Daumiller, Guenther; and Hoffmann, Herwig, 4,153,425, Cl. 44-71.000.
Novak, Leslie M.; and Yen, Leslie, to Rockwell International Corporation. Phase-coded pulse compression type pulsed energy system. 4,153,900, Cl. 343-17.2PC.
NPD Technologies, Inc.: *See*—
Wichterle, Otto, 4,153,349, Cl. 351-160.00H.
NTN Toyo Bearing Co. Ltd.: *See*—
Kimata, Kei; Nakazeki, Tsugito; and Yasuda, Yoshinobu, 4,153,018, Cl. 123-103.00R.
N.V. Optische Industrie "De Oude Delft": *See*—
Houtkamp, Johannes J., 4,153,316, Cl. 316-19.000.
Nye, Norman H., to Medkeff, Arthur T., a part interest. Valve and medicant dispensing syringe. 4,153,186, Cl. 222-378.000.
O. M. Scott & Sons Company, The: *See*—
Parish, Richard L.; and Amerine, James D., 4,153,184, Cl. 222-185.000.
Oberheim, Robert: *See*—
Heintke, Hans E.; Karey, Hans; and Oberheim, Robert, 4,153,359, Cl. 354-126.000.
Obikawa, Tadahiko: *See*—
Iijima, Toshifumi; Obikawa, Tadahiko; and Tanaka, Motoaki, 4,153,460, Cl. 96-74.000.
Obradovits, Nicholas J., to Shower Enclosure Service Company. Shower enclosure. 4,152,790, Cl. 4-149.000.
Occidental Oil Shale, Inc.: *See*—
McCarthy, Harry E.; and French, Gordon B., 4,153,298, Cl. 299-2.000.
Ridley, Richard D., 4,153,110, Cl. 166-262.000.
Ridley, Richard D., 4,153,297, Cl. 299-2.000.
Occidental Petroleum Corporation: *See*—
Garrett, Donald E.; and Mallan, George M., 4,153,514, Cl. 201-2.500.
O'Connor, George L.: *See*—
Kaplan, Leonard; Walker, Wellington E.; and O'Connor, George L., 4,153,623, Cl. 260-449.00L.
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Arlt, Dieter; and Schroer, Hans, to Bayer Aktiengesellschaft. Permanently stabilized polymers produced by after-treatment with piperidine compounds. 4,153,596, Cl. 260-45.80N.
Oertel, Harald: *See*—
Winkelmann, Hans D.; Wolf, Karlheinz; Oertel, Harald; and Weimann, Norbert, 4,153,775, Cl. 528-45.000.
Ogata, Kazuo; and Furuta, Seiya, to Kobe Steel, Ltd. Process for heating steel powder compacts. 4,153,485, Cl. 148-126.000.
Ogata, Yuzuru; Kawaguchi, Takeshi; Kinoshita, Ikuya; Nakayama, Hirokazu; and Ukena, Toshinao, to Kao Soap Co., Ltd. Emulsifier for emulsion polymerization. 4,153,770, Cl. 526-209.000.
Ogawa, Iwakichi, to Takara Co., Ltd. Controlled toy vehicle assembly. 4,152,867, Cl. 46-259.000.
Ogita, Tamotsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Altitude compensating system of a carburetor mounted on a vehicle. 4,153,652, Cl. 261-121.00B.
Ohashi, Masahiro: *See*—
Sakata, Mamoru; Yoshioka, Hiroshi; and Ohashi, Masahiro, 4,153,131, Cl. 180-43.00R.
Ohkura Electric Co. Ltd.: *See*—
Miyazaki, Seiichi, 4,153,848, Cl. 307-268.000.
Ohlsson, Jarl-Erik S. I., to Sisenca S.A. Bookbinding process and binding obtained by this process. 4,153,276, Cl. 281-21.00R.
Ohnuma, Kiyoshi: *See*—
Watanabe, Kazuaki; Kuramochi, Koujiro; and Ohnuma, Kiyoshi, 4,152,957, Cl. 74-606.00R.
Oikawa, Kiyoshi: *See*—
Miwa, Hirohide; Oikawa, Kiyoshi; and Iizuka, Yoshio, 4,153,916, Cl. 358-257.000.
Oizumi, Kyohei: *See*—
Ueno, Haruo; Oizumi, Kyohei; Ishikawa, Hideo; Nakajima, Kohei; Tsujimoto, Nobuhiro; Kimura, Osamu; and Aikawa, Hideyuki, 4,153,767, Cl. 526-141.000.
Okada, Katsuto; Yamamoto, Hideo; Teraguchi, Susumu; and Ishibashi, Norio, to Marinaga Engineering Co. Ltd. Method of treating organic waste water. 4,153,544, Cl. 210-12.000.
Okada, Kazushige: *See*—
Kawasaki, Koichiro; Okada, Kazushige; Suginaka, Yutaka; Adachi, Tokuichi; and Shirasu, Akira, 4,152,976, Cl. 99-450.100.

Okamoto, Noboru: *See*—
Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, 4,153,454, Cl. 75-124.000.
Okamura, Noriaki: *See*—
Yano, Hirofumi; Okamura, Noriaki; and Toyoda, Tsunehiko, 4,153,467, Cl. 106-20.000.
Okano, Shinobu: *See*—
Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, 4,153,454, Cl. 75-124.000.
Oki Electric Industry Co., Ltd.: *See*—
Saito, Makoto, 4,152,940, Cl. 73-653.000.
Ueda, Joji; and Fukushima, Hisao, 4,153,822, Cl. 179-103.000.
Oldenburg, Dorrance, to Caterpillar Tractor Co. Auger-type tree cutter. 4,153,086, Cl. 144-34.00R.
Olin Corporation: *See*—
Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., 4,153,643, Cl. 260-861.000.
Urbanowicz, Edward J., 4,153,193, Cl. 227-156.000.
Olinkraft, Inc.: *See*—
Graser, Earl J.; and Wilson, Jerry F., 4,153,158, Cl. 206-173.000.
Olsen, Rolf E., to Northern Telecom Limited. Telephone tone signalling receiver with up-conversion of frequency of tones controlled by word instructions. 4,153,819, Cl. 179-84.0VF.
Olson, Donald C., to Shell Oil Company. Detecting trace lead in gasolines. 4,153,517, Cl. 204-1.00T.
Olympus Optical Co., Ltd.: *See*—
Fujii, Toru, 4,153,338, Cl. 350-184.000.
Hama, Hiroyuki, 4,153,356, Cl. 354-62.000.
Hayamizu, Yoshisada, 4,153,834, Cl. 250-201.000.
Ondetti, Miguel A.; and Cushman, David W., to E. R. Squibb & Sons, Inc. Relieving angiotension related hypertension with carboxyalkylacylamino acids. 4,153,725, Cl. 424-309.000.
O'Neill, Eugene E., to United States Gypsum Company. Apparatus and process for preparing calcined gypsum. 4,153,373, Cl. 366-165.000.
O'Neill, Peter A., to Howden Compressors Limited. Compressors. 4,153,395, Cl. 418-9.000.
Onoda, Hideki: *See*—
Koide, Tohru; Ezawa, Tabashi; Onoda, Hideki; Masaki, Chiharu; and Morita, Tohru, 4,153,766, Cl. 526-59.000.
Onopchenko, Anatoli: *See*—
Schulz, Johann G. D.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,153,785, Cl. 528-347.000.
Ooi, Hiroshi: *See*—
Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, 4,153,454, Cl. 75-124.000.
Oppermann, Robert A.: *See*—
Messing, Ralph A.; and Oppermann, Robert A., 4,153,510, Cl. 195-59.000.
Optilon W. Erich Heilmann GmbH: *See*—
Heimberger, Helmut, 4,152,813, Cl. 24-205.11F.
Orbisphere Corporation: *See*—
Weber, Eugen, 4,153,149, Cl. 192-95.000.
Orihara, Eiki: *See*—
Hayakawa, Akifumi; Aiba, Akira; Orihara, Eiki; and Fukushima, Kiyoshi, 4,153,231, Cl. 249-82.000.
Osberghaus, Rainer: *See*—
Borggrefe, Gerhard; Moller, Hinrich; Lorenz, Peter; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,153,726, Cl. 424-313.000.
Osborn, James L., to Motorola, Inc. Sectored antenna communications receiver with squelch circuit. 4,153,878, Cl. 325-370.000.
Oshima, Masanao; Tabuchi, Hiroshi; and Inokawa, Tsuneo, to Mitsui Engineering and Shipbuilding Co., Ltd. Ice-breaking apparatus for ships and barges for operation on icy waters. 4,152,999, Cl. 114-42.000.
Osiko, Vyacheslav V.: *See*—
Alexandrov, Vladimir I.; Osiko, Vyacheslav V.; Tatarinsev, Vladimir M.; and Udovenchik, Viktor T., 4,153,469, Cl. 106-42.000.
Otis Engineering Corporation: *See*—
Pounds, Steve R.; Young, Carter R.; and Trahan, Richard J., 4,153,108, Cl. 166-118.000.
Thompson, David B., 4,153,072, Cl. 137-467.000.
Otsuji, Masaaki. Curing apparatus. 4,153,407, Cl. 425-446.000.
Ottman, Everett S., to Turbo Refrigerating Company. Apparatus for producing uniform blocks of ice. 4,153,404, Cl. 425-256.000.
Outboard Marine Corporation: *See*—
Smith, J. Lindley, Jr., 4,153,159, Cl. 206-319.000.
Overland Energy, Inc.: *See*—
Ruder, Carl J., 4,153,104, Cl. 165-48.00S.
Owens-Corning Fiberglas Corporation: *See*—
Greenwood, Mark E., 4,153,177, Cl. 220-85.00R.
Stream, Ralph M., 4,153,438, Cl. 65-2.000.
Owens-Illinois, Inc.: *See*—
Brady, Thomas E.; and Curto, Nicholas J., 4,153,667, Cl. 264-532.000.
McColl, Bruce J., 4,153,265, Cl. 280-112.00A.
Owens, Ossie E. Multi-function clipboard apparatus. 4,153,927, Cl. 362-99.000.
Oxy Metal Industries Corporation: *See*—
Ayano, Yukihiko; Yashiro, Kuniji; and Niizuma, Akira, 4,153,479, Cl. 148-6.15Z.
P. R. Mallory & Co. Inc.: *See*—
Pomerantz, Daniel I., 4,153,872, Cl. 323-21.000.
Stout, Garry A.; and Chestnut, Benjamin F., 4,152,954, Cl. 74-575.000.
Pacitti, William: *See*—
White, David B.; Pacitti, William; and Gensler, Edwin G., 4,153,292, Cl. 297-83.000.
Padmanathan, Thurairajah, to American Cyanamid Company. 2-Methyl-3-nitrobenzophenone. 4,153,632, Cl. 260-591.000.
Paget, Charles J.; and Sands, John L., to Eli Lilly and Company. N-Heterocyclic ureas as immune regulants. 4,153,709, Cl. 424-273.00B.
Palenschat, Dieter: *See*—
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gert; and Wachtel, Helmut, 4,153,713, Cl. 424-274.000.
Pan, Tien H. Automatic pressure flush-toilet of delaying drainage. 4,152,794, Cl. 4-432.000.
Paolinelli, Antonio: *See*—
Pellizzon, Tullio; Piccolo, Luigi; and Paolinelli, Antonio, 4,153,472, Cl. 106-304.000.
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, to Diversey Corporation, The. Process for treatment of metallic surfaces by means of fluorophosphate salts. 4,153,478, Cl. 148-6.15R.
Parish, Richard L.; and Amerine, James D., to O. M. Scott & Sons Company, The. Manually operated applicator having a plurality of rotors for dispensing particulate material. 4,153,184, Cl. 222-185.000.
Park Chemical Company: *See*—
Foreman, Robert W.; Dubal, Gajen P.; and Fox, Charles R., 4,153,481, Cl. 148-15.500.
Park, Kisoon; Bryant, George M.; and Carr, Frazier G., to Union Carbide Corporation. Acrylyl capped urethane oligomers. 4,153,778, Cl. 528-76.000.
Parker-Nosser Company, Inc.: *See*—
Parker, Wallace J.; and Nosser, Gordon N., 4,153,181, Cl. 222-61.000.
Parker, Wallace J.; and Nosser, Gordon N., to Parker-Nosser Company, Inc. Liquid dispenser. 4,153,181, Cl. 222-61.000.
Parrish, Walter A., Jr., to Allis-Chalmers Corporation. Short seat fuel injection nozzle valve. 4,153,205, Cl. 239-533.900.
Paschelke, Gert: *See*—
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gert; and Wachtel, Helmut, 4,153,713, Cl. 424-274.000.
Patton, James S.; and Housel, Richard W., to Atlantic Products Corporation. Expandable luggage bag. 4,153,146, Cl. 190-44.000.
Paul Wurth S.A.: *See*—
Legille, Edouard; and Metz, Paul, 4,153,440, Cl. 65-19.000.
Paulsen, Donald E., to Boeing Company, The; and Aeritalia S.p.A. Electrical/electronic rock equipment bay for aircraft. 4,153,225, Cl. 244-118.00R.
Payne, Joe J. Machine for use in fabricating panels filled with pulverized insulation material. 4,153,084, Cl. 141-80.000.
Pearson, Robert C.: *See*—
Nosowicz, Eugene J.; and Pearson, Robert C., 4,153,950, Cl. 365-231.000.
Pease, Roger F. W., to Bell Telephone Laboratories, Incorporated. Multiple beam exposure system. 4,153,843, Cl. 250-492.00A.
Pehoski, Charles J.: *See*—
Csathy, Denis G.; Hung, Wendell L. Y.; and Pehoski, Charles J., 4,153,012, Cl. 122-7.00R.
Pellizzon, Tullio; Piccolo, Luigi; and Paolinelli, Antonio, to Euteco S.p.A. Process for preparing a red pigmentary iron oxide. 4,153,472, Cl. 106-304.000.
Peltzman, Alan, to Halcon Research and Development Corp. Recovery of vicinal glycol esters by plural stage distillation. 4,153,806, Cl. 560-246.000.
Pen-Chen-Sek, Alexandr I.: *See*—
Litvak, Rafael S.; Rannev, Georgy G.; Anash, Shulim A.; Kim, Larisa P.; Pen-Chen-Sek, Alexandr I.; Borkov, Gennady E.; Nikiforov, Anatoly E.; Shutchenko, Vladimir G.; and Tabachnikov, Mikhail M., 4,153,521, Cl. 204-105.00R.
Perkins Papers Ltd.: *See*—
deVolpi, Charles P., 4,153,157, Cl. 206-225.000.
Permut, Alan R.; Permut, Albert A.; and Permut, Ronald M. Early flood warning system. 4,153,881, Cl. 325-64.000.
Permut, Albert A.: *See*—
Permut, Alan R.; Permut, Albert A.; and Permut, Ronald M., 4,153,881, Cl. 325-64.000.
Permut, Ronald M.: *See*—
Permut, Alan R.; Permut, Albert A.; and Permut, Ronald M., 4,153,881, Cl. 325-64.000.
Persson, John A., to Lectromelt Corporation. Bus bar assembly. 4,153,812, Cl. 13-12.000.
Peter, Zsigmond: *See*—
Barozzi, Dan A.; Calin, Valentin; and Peter, Zsigmond, 4,153,195, Cl. 228-183.000.
Peterka, Miroslav: *See*—
Jelinek, Richard; Rychter, Zdenek; and Peterka, Miroslav, 4,153,676, Cl. 424-9.000.
Peters, Herbert: *See*—
Bauch, Ernst; Kayser, Hans D.; and Peters, Herbert, 4,153,212, Cl. 242-47.000.
Peterson, Fred M. Heat energy homogenizer. 4,152,973, Cl. 98-33.00A.
Peterson, John R.: *See*—
Piper, John L.; and Peterson, John R., 4,153,286, Cl. 294-19.00R.

Petitpierre, Jean C.; and Garner, Robert, to Ciba-Geigy Corporation. 3-Indolyl-3-bis-amino-phenyl-phthalide compounds. 4,153,609, Cl. 260-326.14R.

Petrolite Corporation: *See—*
Bienvenu, Joseph O., 4,153,468, Cl. 106-31.000.

Pettibone, Hugh G. Skirting support system. 4,153,097, Cl. 160-330.000.

Pfaff Industriemaschinen GmbH: *See—*
Klundt, Kurt, 4,152,995, Cl. 112-318.000.

Pfautsch, Don A.: *See—*
Boykin, John C.; Bryan, Edward R.; and Pfautsch, Don A., 4,152,936, Cl. 73-198.000.

Pfeiffer, Carl H. Method and device for teaching the comparative measurement of heat flow. 4,152,847, Cl. 35-19.00R.

Pfister, William J. Golf cart. 4,153,264, Cl. 280-38.000.

Pfistermeister, Martin: *See—*
Coester, Erwin; Krapf, Heinz; Pfistermeister, Martin; Sartor, Bruno; and Mohrhauer, Hans, 4,153,480, Cl. 148-6.350.

Pflieger, Bernard; and Reiniche, Andre, to Compagnie Generale des Etablissements Michelin. Cooling fluid for the manufacture of wire. 4,153,099, Cl. 164-89.000.

Pharmacia Diagnostics AB: *See—*
Hallgren, Henning R.; and Wide, Leif E., 4,153,417, Cl. 23-230.00B.

Phelon Magnagrip Co. Inc.: *See—*
Phelon, Russell E., 4,153,045, Cl. 126-384.000.

Phelon, Russell E., to Phelon Magnagrip Co. Inc. Cooking utensil. 4,153,045, Cl. 126-384.000.

Philagro S.A.: *See—*
Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,153,442, Cl. 71-88.000.

Phillips, David C.: *See—*
Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,153,740, Cl. 427-8.000.

Phillips, John W., to Deluxe Check Printers, Inc. Checkbook cover. 4,153,275, Cl. 281-17.000.

Phillips Petroleum Company: *See—*
McKay, Dwight L., 4,153,536, Cl. 208-120.000.

Phillips, William R., to Crow, Lytle, Gilwee, Donoghue, Adler and Weineger. Chain saw braking mechanism. 4,152,833, Cl. 30-382.000.

Piccolo, Luigi: *See—*
Pellizzon, Tullio; Piccolo, Luigi; and Paolinelli, Antonio, 4,153,472, Cl. 106-304.000.

Pickering & Company, Inc.: *See—*
Wittenberg, Roland C.; Alexandrovich, George; and Frielingsdorf, Frank J., 4,153,257, Cl. 274-39.00R.

Pierce, Chardo W., to Pierce Micronizing Company. Micronized wafer. 4,153,733, Cl. 426-72.000.

Pierce Micronizing Company: *See—*
Pierce, Chardo W., 4,153,733, Cl. 426-72.000.

Pigeon, Michel; and Vienot, Claude, to Commissariat a l'Energie Atomique. Eddy-current testing device for metal tubes which are bent at least locally. 4,153,875, Cl. 324-220.000.

Pilgrim Engineering Developments Limited: *See—*
Bunyan, Thomas W., 4,153,280, Cl. 285-97.000.
Bunyan, Thomas W., 4,153,656, Cl. 264-40.100.

Pilkington P.E. Limited: *See—*
Swift, David W., 4,153,913, Cl. 358-93.000.

Pinnington, Clive: *See—*
Clayfield, Eric J.; Pinnington, Clive; Cannon, Michael J.; and Sant, Peter, 4,153,419, Cl. 44-23.000.

Piper, John L.; and Peterson, John R. Tool for handling hanging plants. 4,153,286, Cl. 294-19.00R.

Piquilloud, Pierre C., to Sommer Exploitation. Floor and/or wall covering. 4,153,750, Cl. 428-107.000.

Pizzuti, Donato F.; and Triggs, Charles W., to Polaroid Corporation. Lens shield actuated auto/manual focus control inhibit/override. 4,153,903, Cl. 354-195.000.

Plagenhoef, Stanley C., to Motion Analysis, Inc. Bioengineered game racket. 4,153,249, Cl. 273-73.00C.

Playfoot, Kerwin C.: *See—*
Todt, William H.; and Playfoot, Kerwin C., 4,152,937, Cl. 73-290.00R.

Plempel, Manfred: *See—*
Kramer, Wolfgang; Buchel, Karl H.; and Plempel, Manfred, 4,153,692, Cl. 424-245.000.
Kramer, Wolfgang; Buchel, Karl H.; and Plempel, Manfred, 4,153,708, Cl. 424-273.00R.

Plessey Handel und Investments AG: *See—*
Townshend, Maurice P., 4,153,320, Cl. 339-91.00B.

Plyler, Robert G.; Seagreaves, George F.; and Suverison, Lyle B., to General Motors Corporation. Locking shield for electrical terminal. 4,153,319, Cl. 339-75.00P.

Poland, Sydney W., to Texas Instruments Incorporated. Microprocessor system having high order capability. 4,153,937, Cl. 364-706.000.

Polaroid Corporation: *See—*
Bader, Henry; and Whitten, Charles E., 4,153,631, Cl. 260-590.00C.
Bruneau, Louis O., 4,152,825, Cl. 29-623.200.
Dietz, Milton S.; and McCune, William J., Jr., 4,153,362, Cl. 354-293.000.
Gerber, Arthur M.; and Walworth, Vivian K., 4,153,462, Cl. 96-94.00R.
Gold, Nathan, 4,153,912, Cl. 358-44.000.
Gold, Nicholas, 4,153,353, Cl. 353-114.000.
Pizzuti, Donato F.; and Triggs, Charles W., 4,153,903, Cl. 354-195.000.

Poliniak, Eugene S.; and Desai, Nitin V., to RCA Corporation. Method for forming a surface relief pattern in a poly(olefin sulfone) layer. 4,153,741, Cl. 427-38.000.

Polis, B. David; and Polis, Edith. Novel prostaglandin derivatives, certain in vivo and in vitro effects thereof and processes for the preparation of same. 4,153,808, Cl. 562-503.000.

Polis, Edith: *See—*
Polis, B. David; and Polis, Edith, 4,153,808, Cl. 562-503.000.

Polking, Hans: *See—*
Bald, Wilfried; and Polking, Hans, 4,152,919, Cl. 72-250.000.

Polyakov, Dmitry K.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Polyakov, Vasily V.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Pombrol, Rogelio R., to Kravex Manufacturing Company. Battery booster cable. 4,153,321, Cl. 339-95.00B.

Pomerantz, Daniel I., to P. R. Mallory & Co. Inc. Crest firing means. 4,153,872, Cl. 323-21.000.

Pond, Robert B. Lacrosse stick mesh. 4,153,251, Cl. 273-96.00D.

Ponsford, Roger J., to Beecham Group Limited. 3-Thio-5-methyl-7-oxo-1-azabicyclo[3,2,0]hept-2-ene-2-carboxylic acid esters, their production and use. 4,153,714, Cl. 424-274.000.

Ponsinet, Gerard: *See—*
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,153,698, Cl. 424-258.000.
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,153,699, Cl. 424-258.000.

Poppa, Rocco, to Magnavox Company, The. Electrically tunable bandpass filter. 4,153,887, Cl. 333-172.000.

Portner, Peer M.: *See—*
Clark, Kenneth D.; Jassawalla, Jal S.; and Portner, Peer M., 4,152,786, Cl. 3-1.700.

Potes, Willi: *See—*
Gerken, Rudolf; Guth, Hans; Mucke, Christoph; Potes, Willi; and Wieschen, Hermann, 4,153,628, Cl. 423-531.000.

Pounds, Steve R.; Young, Carter R.; and Trahan, Richard J., to Otis Engineering Corporation. Well tool. 4,153,108, Cl. 166-118.000.

Pourrias, Bernard M.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., 4,153,620, Cl. 260-346.730.

Powell, Christopher M. Dual stereographic net. 4,152,835, Cl. 33-1.0SD.

Powell, Justin C.; and Cummings, William M., to Texaco Inc. Process for the preparation of alkenylated dicarboxylic acid lactones. 4,153,616, Cl. 260-343.500.

Power, James H.; and Akman, Ahmet R., to Ford Motor Company. Ignition distributor with wide rotor registration angle. 4,153,030, Cl. 123-146.50A.

PPG Industries, Inc.: *See—*
Cherenko, Joseph; and Lewis, Charles W., 4,153,526, Cl. 204-159.210.
Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, 4,153,776, Cl. 528-49.000.
Hockswender, Thomas R.; and Hartman, Marvis E., 4,153,586, Cl. 260-18.0EP.
Zwack, Robert R.; and Christenson, Roger M., 4,153,545, Cl. 210-23.00F.

Prain, Hunter D.: *See—*
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,153,704, Cl. 424-270.000.

Prater, Earle F., to Birtcher Corporation, The. Handle assembly. 4,153,314, Cl. 312-320.000.

Preston, Frank J.; Kraus, Theodore C.; and Chandalia, Kiran B., to Olin Corporation. Graft copolymers from unsaturated monomers and peroxy di-ester polyols and polyurethanes prepared therefrom. 4,153,643, Cl. 260-861.000.

Preussag Aktiengesellschaft: *See—*
Winnacker, Helmut; and Dierssen, Jurgen, 4,153,357, Cl. 354-64.000.

Preway Inc.: *See—*
Billmeyer, Thomas F.; and Faehling, Francis L., 4,153,036, Cl. 126-121.000.

Prinz, Richard: *See—*
Steffen, Ulrich; Alberts, Heinrich; and Prinz, Richard, 4,153,646, Cl. 260-878.00R.

Prober, Maurice: *See—*
MacKenzie, Burton T., Jr.; Prober, Maurice; and Kiersztyn, Stanley E., 4,153,752, Cl. 428-379.000.

Proizvodstvennoe Ubiedinenie "Baz": *See—*
Rumyantsev, Leonid A.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,152,894, Cl. 60-347.000.

Propst, Robert L., to Herman Miller, Inc. Storage locker. 4,153,313, Cl. 312-211.000.

Pruckmayr, Gerfried, to Du Pont de Nemours, E. I., and Company. Method for preparing ester end-capped copolyether glycols. 4,153,786, Cl. 528-408.000.

PTX-Pentronix, Inc.: *See*—
DeSantis, Raymond P., 4,153,399, Cl. 425-78.000.

Puchel, Ernst: *See*—
Stahl, Dieter; and Puchel, Ernst, 4,153,470, Cl. 106-116.000.

Puffr, Rudolf; and Sebenda, Jan, to Ceskoslovenska akademie ved. Method for the preparation of polymers of lactams having an enhanced electric conductivity. 4,153,582, Cl. 252-511.000.

Pullman Incorporated: *See*—
Becker, Colman L., 4,153,673, Cl. 423-359.000.

Puttner, Reinhold; and Joppien, Hartmut, both of, to Schering Aktiengesellschaft. Thiazolyl cinnamic acid nitriles, pesticides containing the same. 4,153,705, Cl. 424-270.000.

Quick, Donald J., to Massey-Ferguson Services N.V. Harvester for sugar cane. 4,152,883, Cl. 56-13.900.

Quinlan, James M., to American Cyanamid Company. Levamisole effervescent tablets. 4,153,678, Cl. 424-44.000.

Ra Shipping Ltd. Oy: *See*—
Myreen, Bertel, 4,153,420, Cl. 44-33.000.

Raaf, Helmut; and Heumann, Oskar, to Blendax-Werke R. Schneider GmbH & Co. Toothbrush. 4,152,806, Cl. 15-169.000.

Ragaly, Istvan, to Robert Bosch GmbH. Dual voltage network electrical power supply system, particularly for automotive vehicles. 4,153,869, Cl. 322-90.000.

Raimund, Hauser: *See*—
Stockl, Friedrich, 4,153,351, Cl. 352-91.00C.

Rampolla, Robert W.; and Van Hook, Brewton O., to Westinghouse Electric Corp. Laser command guidance system. 4,153,224, Cl. 244-3.160.

Rannev, Georgy G.: *See*—
Litvak, Rafael S.; Rannev, Georgy G.; Anash, Shulim A.; Kim, Larisa P.; Pen-Chen-Sek, Alexandr I.; Borkov, Gennady E.; Nikiforov, Anatoly E.; Shutchenko, Vladimir G.; and Tabachnikov, Mikhail M., 4,153,521, Cl. 204-105.00R.

Rau, John W., III; Muller, Harold H.; Tam, Richard K. W.; and Kabell, Louis J., to Burroughs Corporation. Electrically programmable read-only-memory device. 4,153,949, Cl. 365-104.000.

Ray, Charles W. Method and apparatus for providing removable Service to connections to a high pressure main. 4,153,067, Cl. 137-15.000.

Raymond Lee Organization, Inc.: *See*—
Mahabir, Vanda J., 4,153,093, Cl. 150-35.000.

Rayno, Glenn D.: *See*—
den Hollander, Jacob; and Rayno, Glenn D., 4,153,493, Cl. 156-188.000.

RCA Corporation: *See*—
Bloom, Allen; and Hung, Ling K., 4,153,343, Cl. 350-349.000.
Lim, Chong C., 4,153,862, Cl. 315-408.000.
Poliniak, Eugene S.; and Desai, Nitin V., 4,153,741, Cl. 427-38.000.
Siekanowicz, Wieslaw W.; and Credelle, Thomas L., 4,153,856, Cl. 313-422.000.

Realty & Industrial Corporation: *See*—
Grier, William R.; Shepard, Francis H., Jr.; and Arledge, Arthur L., 4,153,940, Cl. 340-711.000.

Recherches Pharmaceutiques et Scientifiques: *See*—
Warolin, Christian J. M.; Muller, Pierre; and Zaoui, Roger, 4,153,729, Cl. 424-325.000.

Recktenwald, Gerald W.; and Hayes, Larry J., to Air Products and Chemicals, Inc. Enhancing solvent barrier property of pigmented polymeric bodies. 4,153,659, Cl. 264-83.000.

Recognition Equipment Incorporated: *See*—
Weisbrod, James G.; and Eby, John C., Jr., 4,153,895, Cl. 340-146.3AG.
White, John T.; and Lovelady, Kenneth T., 4,153,901, Cl. 346-75.000.

Reddy, Redreddy S., to Vapor Corporation. Actuating mechanism for electrical switches. 4,153,826, Cl. 200-44.000.

Redmond, Patrick J., to Deflecta-Shield Corp. Air current deflector shield for vehicles. 4,153,129, Cl. 180-68.00P.

Ree, Buren R.; Errede, Louis A.; Jefson, Gary B.; and Langager, Bruce A., to Minnesota Mining and Manufacturing Company. Method of making polytetrafluoroethylene composite sheet. 4,153,661, Cl. 264-120.000.

Reed, Denvil E.; and Grimm, Richard C., to Union Carbide Corporation. Process for separating alkoxyketone compounds from the corresponding 1-alkoxy-2-alkanol compound. 4,153,516, Cl. 203-64.000.

Reed, Russell, Jr.: *See*—
Lundstrom, Norman H.; and Reed, Russell, Jr., 4,152,987, Cl. 102-6.000.

Reese, Cecil E., to Du Pont de Nemours, E. I., and Company. Process for producing a mixed-shrinkage heat-bulkable polyester yarn. 4,153,660, Cl. 264-103.000.

Reffert, Rudi W.: *See*—
Fink, Peter; Wild, Hans; Zizlsperger, Johann; Reffert, Rudi W.; and Thielen, Gunter, 4,153,501, Cl. 159-49.000.

Reichle, Walter T.: *See*—
Karol, Frederick J.; Wu, Chisung; Reichle, Walter T.; and Maraschin, Norma J., 4,153,576, Cl. 252-428.000.

Reinhardt, Gerd: *See*—
Schnabel, Eugen; Reinhardt, Gerd; Schlumberger, Horst D.; Truscheit, Ernst; and Tschesche, Harold, 4,153,687, Cl. 424-177.000.

Reiniche, Andre: *See*—
Pflieger, Bernard; and Reiniche, Andre, 4,153,099, Cl. 164-89.000.

Reisdorf, Daniel: *See*—
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,153,698, Cl. 424-258.000.
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,153,699, Cl. 424-258.000.

Reiss, Adam: *See*—
Vomhof, Paul; Reiss, Adam; and Schmidt, Karl-Heinz, 4,153,208, Cl. 241-82.400.

Reliance Electric Company: *See*—
Schmitz, William D.; Turpin, Richard H.; Dashiell, Robert A.; and Hadley, Chris L., 4,153,936, Cl. 364-493.000.

Remley, Kenneth H., to American Cyanamid Company. Process for imparting flame resistance and resistance to ultraviolet light-induced shade change to vat-dyed cellulosic textile materials. 4,153,744, Cl. 427-160.000.

Renbarger, Jerry J.; and Yonan, Peter K., to G. D. Searle & Co. α-Aryl-α, α-bis[ω- (disubstituted amino)alkyl]acetamides and related compounds. 4,153,797, Cl. 546-237.000.

Rennick, Robert D., to Rockwell International Corporation. Method of treating an alkali metal sulfide liquor. 4,153,670, Cl. 423-189.000.

Renshaw, Alan. Micro-sampling device. 4,152,939, Cl. 73-425.40R.

Rentema, Albertus P.: *See*—
Meijer, Albert J.; and Rentema, Albertus P., 4,152,830, Cl. 30-195.000.

Renzulli, Michael A.; and DelMastro, Fiorentino G., to United Technologies Corporation. Plasma arc welder for titanium blade spars. 4,153,831, Cl. 219-121.00P.

Resnick, Theodore M., to SmithKline Corporation. 3-Acyl-5-alkyl-2H-pyran-2,4,6-(3H,5H)-triones and their 4-hydroxy tautomers. 4,153,720, Cl. 424-283.000.

Reustle, Walter C. Automatic hopper door opener. 4,153,168, Cl. 414-786.000.

Rex, Dietrich, to Erno Raumfahrttechnik GmbH. Solar energy collector. 4,153,474, Cl. 136-89.0PC.

Reynolds Metals Company: *See*—
Goolsby, Patrick F., 4,153,043, Cl. 126-271.000.
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., 4,153,464, Cl. 106-14.270.

Rhamstine, Chester F., to General Motors Corporation. Vehicle seat back reclining mechanism. 4,153,296, Cl. 297-367.000.

Rheinmetall GmbH: *See*—
Romer, Rudolf; Trommsdorff, Wolf; and Jaeneke, Christian, 4,153,223, Cl. 244-3.100.

Rhodes, Donald E.: *See*—
Leonard, Robert E.; and Rhodes, Donald E., 4,153,538, Cl. 208-177.000.

Rhodes, Jack K. Impact absorbing device. 4,153,144, Cl. 188-266.000.

Rhodia, Inc.: *See*—
Gradeff, Peter S.; and Angeles, Marshall R., 4,153,633, Cl. 260-593.00R.
Murayama, Stanley T., 4,153,634, Cl. 260-593.00R.

Rhone-Poulenc Industries: *See*—
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,153,698, Cl. 424-258.000.
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,153,699, Cl. 424-258.000.

Rhone-Poulenc-Textile: *See*—
Thillier, Robert; and Vaginay, Yves, 4,153,781, Cl. 528-274.000.

Ribka, Joachim: *See*—
Humuller, Edwin; Keil, Karl-Heinz; and Ribka, Joachim, 4,153,561, Cl. 252-8.750.

Richardson-Merrell Inc.: *See*—
Grisar, Johann M.; Blohm, Thomas R.; and Roberts, Edward M., 4,153,235, Cl. 260-239.00B.

Ricoh Company, Ltd.: *See*—
Mizuma, Kenichi, 4,153,242, Cl. 271-9.000.
Suzuki, Koichi; and Suzuki, Shigeru, 4,153,364, Cl. 355-14.000.

Ridley, Richard D., to Occidental Oil Shale, Inc. Ignition of fragmented oil shale below a sill pillar in an in situ oil shale retort. 4,153,110, Cl. 166-262.000.

Ridley, Richard D., to Occidental Oil Shale, Inc. Ground water control for an in situ oil shale retort. 4,153,297, Cl. 299-2.000.

Riedinger, Alan B., to UOP Inc. Method and apparatus for conditioning demineralized water. 4,153,556, Cl. 210-218.000.

Riefenthaler, Johann, to Spezialfabrik moderner Pumpen Ernst Vogel. Self-drawing centrifugal pump. 4,153,385, Cl. 415-53.00R.

Rieth, Egon: *See*—
Barenyi, Bela; Haselmann, Heinrich; and Rieth, Egon, 4,153,290, Cl. 296-191.000.

Riffanacht, John D.: *See*—
Cozine, Mark L.; Komancheck, John J.; and Riffanacht, John D., 4,153,436, Cl. 55-290.000.

Rifkin, Arnold S. Reusable transit container. 4,153,090, Cl. 150-15.000.

Riker Laboratories, Inc.: *See*—
Hammar, Walton J.; and Rustad, Mark A., 4,153,721, Cl. 424-285.000.
Scherrer, Robert A., 4,153,619, Cl. 260-346.220.
Scherrer, Robert A.; Hammar, Walton J.; and Stern, Richard M., 4,153,716, Cl. 424-274.000.

Rimberg, David B.: *See*—
Beman, Donald K.; Faccioli, Edward A.; and Rimberg, David B., 4,153,432, Cl. 55-90.000.

Risk, Daniel W., to Maxton Manufacturing Company. Hydraulic valve. 4,153,074, Cl. 137-596.120.

Risko, Richard C., to General Motors Corporation. Occupant restraint cushion system. 4,153,273, Cl. 280-740.000.

Ritter, Eberhard: *See—*
Heise, Hartmut; Leibmann, Bernd; Morler, Dieter; Ritter, Eberhard; and Sahm, Wilfried, 4,153,798, Cl. 548-305.000.
Rivin, Ervin M.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.
Rizhsky Politekhnichesky Institut: *See—*
Kulberg, Anton Y.; Kalnin, Robert K.; Ioffe, Benyamin A.; Litvinenko, Semen K.; and Leikin, Roman S., 4,153,151, Cl. 198-456.000.
Robert Bosch GmbH: *See—*
Bertling, Johannes-Gerhard, 4,153,024, Cl. 123-124.00R.
Bianchi, Valerio; and Latsch, Reinhard, 4,153,013, Cl. 123-32.0EA.
Goebels, Hermann J., 4,153,307, Cl. 303-119.000.
Guyen, Xiem, 4,153,337, Cl. 350-184.000.
Kalkhof, Bernd W., 4,153,031, Cl. 123-146.50D.
Lietar, Christian; and Jeannin, Pierre, 4,153,367, Cl. 356-400.000.
Ragaly, Istvan, 4,153,869, Cl. 322-90.000.
Roberts, Edward M.: *See—*
Grisar, Johann M.; Blohm, Thomas R.; and Roberts, Edward M., 4,153,235, Cl. 260-239.00B.
Roberts, Richard A., to University Patents, Inc. System for detecting fat particles in blood. 4,152,928, Cl. 73-61.00R.
Roche, Andre; and Schepacz, Charles, to Centre Technique des Industries Mecaniques. Method of electrochemical machining. 4,153,524, Cl. 204-129.430.
Rockwell International Corporation: *See—*
Novak, Leslie M.; and Yen, Leslie, 4,153,900, Cl. 343-17.2PC.
Rennick, Robert D., 4,153,670, Cl. 423-189.000.
Rockwool Aktiebolaget: *See—*
Tomic, Relja; Aberg, Ulf; and Karlsson, Elis, 4,153,439, Cl. 65-2.000.
Rodosta, John; and Weisler, Morris J. Bed rocking mechanism. 4,152,795, Cl. 5-62.000.
Rodriguez, Philip A. B.: *See—*
Fern, William A.; and Rodriguez, Philip A. B., 4,153,624, Cl. 260-453.00P.
Rodrique, Marcel. Measurement line marker. 4,152,836, Cl. 33-87.000.
Roduner, Larry D.: *See—*
Bullard, Herbert L.; and Roduner, Larry D., 4,153,771, Cl. 526-221.000.
Roesch, Egon: *See—*
Wolff, Hans P.; Witte, Ernst-Christian; Thiel, Max; Stork, Harald; and Roesch, Egon, 4,153,728, Cl. 424-319.000.
Roether, Kurt: *See—*
Hellmund, Wolfgang; Krug, Gerhard; Missaire, Gerhard; Roether, Kurt; and Schatton, Paul, 4,153,283, Cl. 285-334.000.
Rogalski, Werner: *See—*
Gericke, Rolf; Rogalski, Werner; Bergmann, Rolf; Hameister, Walter; and Wahlig, Helmut, 4,153,693, Cl. 424-246.000.
Rogers, Lloyd W., Jr.; and Klove, Edwin H., Jr., to General Motors Corporation. Winding prevention belt retractor for passive shoulder belt system. 4,153,274, Cl. 280-745.000.
Rohm GmbH: *See—*
Vetter, Heinz; and Friedrich, Ernst, 4,153,663, Cl. 264-286.000.
Rohmfeld, Josef, to Siemens Aktiengesellschaft. X-ray diagnosis apparatus for transverse layer images. 4,153,842, Cl. 250-445.00T.
Roll, Werner: *See—*
Becker, Karl-Heinz; Gunther, Friedhelm; Gerber, Manfred; and Roll, Werner, 4,153,216, Cl. 242-56.200.
Romanik, Lawrence J.; and Jones, Robert W. Hand slicer for prepared meats. 4,152,963, Cl. 83-762.000.
Romer, Rudolf; Trommsdorff, Wolf; and Jaeneke, Christian, to Rheinmetall GmbH. Limited-range projectile having a flat trajectory. 4,153,223, Cl. 244-3.100.
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., to Nabisco, Inc. Textured vegetable protein flakes. 4,153,738, Cl. 426-656.000.
Rooney, Clarence S.: *See—*
Atkinson, Joseph G.; Rooney, Clarence S.; Girard, Yves; and Engelhardt, 4,153,715, Cl. 424-274.000.
Roos, Ernst: *See—*
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Arlt, Dieter; and Schroer, Hans, 4,153,596, Cl. 260-45.80N.
Roquette Freres: *See—*
Huchette, Michel; and Bussiere, Guy, 4,153,734, Cl. 426-250.000.
Rosati, Enzo, to Aziende Colori Nazionali Affini -ACNA S.p.A. Monoazo-dyes particularly suited to the levelled dyeing of synthetic polyamide fibers. 4,153,599, Cl. 260-207.000.
Rose, Alan C. Fluid control arrangements, applicable to spa facilities. 4,152,791, Cl. 4-172.000.
Roselius, Wilhelm; Vitzthum, Otto; and Hubert, Peter, to Studiengesellschaft Kohle mbH. Process for the extraction of nicotine from tobacco. 4,153,063, Cl. 131-143.000.
Rosemount Inc.: *See—*
Grindheim, Earl A., 4,153,873, Cl. 324-60.00R.
Rosenberg, Arnold M.; and Gaidis, James M., to W. R. Grace & Co. Method of controlling and removing ice and snow from roads and bridges. 4,153,473, Cl. 134-5.000.
Rosenberg, Carl S., to Lake Shore Roentgenology Ltd. Treatment of the acute after-effects resulting from alcohol ingestion. 4,153,700, Cl. 424-261.000.
Rosenberger, Michael, to Hoffmann-La Roche Inc. Preparation of food coloring agents. 4,153,805, Cl. 560-240.000.
Ross, Desmond E.: *See—*
Lans, Kenneth I. T.; and Ross, Desmond E., 4,153,111, Cl. 166-315.000.
Ross, Geoffrey A.: *See—*
Schachte, John J.; and Ross, Geoffrey A., 4,153,863, Cl. 318-341.000.
Ross, Sigmund L.; Shuffman, Oscar, deceased; and by Shuffman, Rose, executrix. Cryothermal manipulation of petroleum. 4,153,537, Cl. 208-177.000.
Ross, Thaddeus C., to ANARAD, Inc. Optical gas analyzer. 4,153,837, Cl. 250-343.000.
Rothkegel, Bernhard; and Schreiner, Horst, to Siemens Aktiengesellschaft. Impregnated sintered material for electrical contacts and method for its production. 4,153,755, Cl. 428-569.000.
Rothmayer, Noel Y.: *See—*
Fitch, Robert H.; Kurtz, Bruce E.; and Rothmayer, Noel Y., 4,153,532, Cl. 204-267.000.
Roure, Lucien: *See—*
Boulanger, Philippe; and Roure, Lucien, 4,153,295, Cl. 297-307.000.
Rowsell, David G.; Spring, David J.; and Hems, Roger, to Wilkinson Sword Limited. Acyclic carboxamides having a physiological cooling effect. 4,153,679, Cl. 424-45.000.
Rubin, Leon J.: *See—*
Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., 4,153,613, Cl. 260-340.90R.
Ruck, Heinz E.: *See—*
Walters, Eugene G.; and Ruck, Heinz E., 4,153,348, Cl. 351-118.000.
Ruder, Carl J., to Overland Energy, Inc. Solar heating and cooling system. 4,153,104, Cl. 165-48.00S.
Rumpf, Hans; Maly, Karl; and Leschonski, Kurt. Method and apparatus for the continuous centrifugal classifying of a continuous flow of particulate material in a deflected flow. 4,153,541, Cl. 209-143.000.
Rumyantsev, Leonid A.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., to Tsentralny Nauchno-Issledova-Telsky Avtomobilny i. Avtomotorny Institut "Nami"; and Proizvodstvennoe Ubiedinenie "Baz". Control system of hydraulic torque converter of transport vehicle. 4,152,894, Cl. 60-347.000.
Ruscher, Fredric C. Jewelry display case. 4,153,154, Cl. 206-45.190.
Rustad, Mark A.: *See—*
Hammar, Walton J.; and Rustad, Mark A., 4,153,721, Cl. 424-285.000.
Rychter, Zdenek: *See—*
Jelinek, Richard; Rychter, Zdenek; and Peterka, Miroslav, 4,153,676, Cl. 424-9.000.
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., to Exxon Research & Engineering Co. Oxazoline additives useful in oleaginous compositions. 4,153,566, Cl. 252-51.50A.
S&C Electric Company: *See—*
Swanson, Roy T., 4,153,893, Cl. 337-201.000.
Sabee, Reinhardt N. Process for pattern drawing of webs. 4,153,664, Cl. 264-289.000.
Sabourin, Edward T.: *See—*
Schulz, Johann G. D.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,153,785, Cl. 528-347.000.
Sack, Stanley F.; and Mattuck, Morris, to Canadian General Electric Company, Ltd. Method of forming a dry well fuseholder. 4,153,492, Cl. 156-172.000.
Sagel, John A.: *See—*
Barton, Brandon H.; and Sagel, John A., 4,153,625, Cl. 260-457.000.
Sahm, Wilfried: *See—*
Heise, Hartmut; Leibmann, Bernd; Morler, Dieter; Ritter, Eberhard; and Sahm, Wilfried, 4,153,798, Cl. 548-305.000.
Saint-Gobain Industries: *See—*
Bichot, Bernard H.; and Gest, Rene, 4,153,498, Cl. 156-446.000.
Saito, Makoto, to Oki Electric Industry Co., Ltd. Vibration detector. 4,152,940, Cl. 73-653.000.
Sakaida, Kaku, to Trio Kabushiki Kaisha. Shock muting circuit for use in an AM receiver. 4,153,879, Cl. 325-478.000.
Sakasai, Masao: *See—*
Hamazaki, Yasuhiko; Yamamoto, Toshiyuki; Kawabata, Shozo; Seri, Kenji; Sakasai, Masao; Sato, Reiko; and Ishiyama, Nobuo, 4,153,724, Cl. 424-308.000.
Sakata, Mamoru; Yoshioka, Hiroshi; and Ohashi, Masahiro, to Honda Giken Kogyo Kabushiki Daisha. Suspension device for front wheels in automotive vehicles. 4,153,131, Cl. 180-43.00R.
Salanon S.A.: *See—*
Martinez, Ginez, 4,152,810, Cl. 16-144.000.
Saldarriaga, Nydia; and Aragon, Gregorio. Broom cover. 4,152,805, Cl. 15-168.000.
Samejima, Shunichi: *See—*
Yamabe, Masaaki; Munekata, Seiji; and Samejima, Shunichi, 4,153,804, Cl. 560-183.000.
Samsing, Rolf A., to Gillette Company, The. Product display card. 4,153,162, Cl. 206-476.000.
Sanada, Seiji: *See—*
Isono, Katsuo; and Sanada, Seiji, 4,153,911, Cl. 358-10.000.
Sanders Associates, Inc.: *See—*
Cote, Maurice R., 4,153,888, Cl. 333-97.00S.

Sanders, James M.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,811, Cl. 568-820.000.

Sanderson, Charles H. Water treatment device and method for manufacturing same. 4,153,559, Cl. 210-222.000.

Sanderson, Clifford, to Bata Shoe Company, Inc. Injection apparatus control. 4,153,402, Cl. 425-145.000.

Sandner, Bernhard: *See—*
Deiner, Hans; Sandner, Bernhard; and Bernheim, Willy, 4,153,640, Cl. 260-827.000.

Sands, John L.: *See—*
Paget, Charles J.; and Sands, John L., 4,153,709, Cl. 424-273.00B.

Sanford, Karl J.: *See—*
Hill, Doyle E.; and Sanford, Karl J., 4,153,668, Cl. 422-56.000.

Sanno, Yasushi: *See—*
Ishiguro, Toshihiro; and Sanno, Yasushi, 4,153,794, Cl. 544-358.000.

Sant, Peter: *See—*
Clayfield, Eric J.; Pinnington, Clive; Cannon, Michael J.; and Sant, Peter, 4,153,419, Cl. 44-23.000.

Santora, Norman J.: *See—*
Campbell, Henry F.; Santora, Norman J.; and Douglas, George H., 4,153,722, Cl. 424-304.000.

Sanyo Electric Co., Ltd.: *See—*
Ikeguchi, Shigehiko; and Yamashita, Norio, 4,153,884, Cl. 331-1.00A.

Sapino, Anthony P.; Swatik, Donald S.; Costello, Robert E.; Malakian, Vahe H.; and Staugaard, Kenneth, to Computer Peripherals, Inc. Dual pitch impact printing mechanism and method. 4,152,981, Cl. 101-93.010.

Sarkissian, Berge, to Uniroyal, Inc. Pneumatic tire having a pneumatic safety insert with beads. 4,153,095, Cl. 152-340.000.

Sartor, Bruno: *See—*
Coester, Erwin; Krapf, Heinz; Pfistermeister, Martin; Sartor, Bruno; and Mohrhauer, Hans, 4,153,480, Cl. 148-6.350.

Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrick GmbH): *See—*
Knothe, Erich; Berg, Christoph; Stadler, Eberhard; and Kohne, Hans-Heinrich, 4,153,126, Cl. 177-229.000.

Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrik GmbH): *See—*
Knothe, Erich; Berg, Christoph; and Melcher, Franz J., 4,153,124, Cl. 177-210.0EM.

Sasaki, Takashi: *See—*
Araki, Kunio; Sasaki, Takashi; Tabei, Kiyoshi; and Goto, Kazuo, 4,153,525, Cl. 204-159.150.

Sato, Masato; and Nakamizo, Keiichi, to Kawasaki Jukogyo Kabushiki. Magneto casing. 4,153,034, Cl. 123-198.00E.

Sato, Masatoshi: *See—*
Akaike, Junichi; and Sato, Masatoshi, 4,152,832, Cl. 30-276.000.

Sato, Masayuki, to Tokyo Shibaura Electric Co., Ltd. Multiplex data processing system. 4,153,934, Cl. 364-200.000.

Sato, Mikio: *See—*
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,153,508, Cl. 195-31.00P.

Sato, Reiko: *See—*
Hamazaki, Yasuhiko; Yamamoto, Toshiyuki; Kawabata, Shozo; Seri, Kenji; Sakasai, Masao; Sato, Reiko; and Ishiyama, Nobuo, 4,153,724, Cl. 424-308.000.

Sato, Takefumi, to Sharp Kabushiki Kaisha. Fail-safe apparatus for anti-skid braking system. 4,153,306, Cl. 303-92.000.

Saucy, Gabriel, to Hoffmann-La Roche Inc. Method of producing coloring agents. 4,153,615, Cl. 260-340.90R.

Saunders, John B.; and Davis, James S., to Union Carbide Corporation. Prepurification of toluene dealkylation effluent gas. 4,153,428, Cl. 55-26.000.

Savio & C. S.p.A.: *See—*
Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, 4,153,214, Cl. 242-47.010.

Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, to Savio & C. S.p.A. Device for controlling the tension in the yarn unwinding from a yarn carrying body. 4,153,214, Cl. 242-47.010.

Sawada, Hideo; and Kawamoto, Junji, to Daicel Ltd. Cigarette filters. 4,153,064, Cl. 131-267.000.

Saxon, Bruce R., to International Telephone & Telegraph Corporation. Paging amplifier for a key telephone system. 4,153,820, Cl. 179-1.00A.

Sayama, Norio: *See—*
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, 4,153,644, Cl. 260-876.00B.

Scaglione, Felice: *See—*
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,153,738, Cl. 426-656.000.

Schachte, John J.; and Ross, Geoffrey A., to Colt Industries Operating Corp. (Pratt & Whitney Machine Tool Division). DC Motor controller. 4,153,863, Cl. 318-341.000.

Schaeffer, Robert L., to General Electric Company. Food processing appliance. 4,153,210, Cl. 241-282.100.

Schatton, Paul: *See—*
Hellmund, Wolfgang; Krug, Gerhard; Missaire, Gerhard; Roether, Kurt; and Schatton, Paul, 4,153,283, Cl. 285-334.000.

Schepacz, Charles: *See—*
Roche, Andre; and Schepacz, Charles, 4,153,524, Cl. 204-129.430.

Scherberich, Paul, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of thiazoline-(3) compounds. 4,153,606, Cl. 260-306.70R.

Schering Aktiengesellschaft: *See—*
Boroschewski, Gerhard; and Arndt, Friedrich, 4,153,447, Cl. 71-111.000.
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gert; and Wachtel, Helmut, 4,153,713, Cl. 424-274.000.
Puttner, Reinhold; and Joppien, Hartmut, both of, 4,153,705, Cl. 424-270.000.

Schering Corporation: *See—*
Serfontein, Willem J., 4,153,685, Cl. 424-94.000.

Scherrer, Herbert; Bopp, Ernst; and Cecchetto, Ennio, to Franz Buttner AG. Re-inking and ventilation control for inked ribbon cassette. 4,153,378, Cl. 400-196.100.

Scherrer, Robert A., to Riker Laboratories, Inc. Intermediates for 2-nitro-3-phenylbenzofuran alkan(and-en)oic acids. 4,153,619, Cl. 260-346.220.

Scherrer, Robert A.; Hammar, Walton J.; and Stern, Richard M., to Riker Laboratories, Inc. Oxy, thio, sulfenyl and sulfonyl derivatives of 2-nitro-3-phenylbenzofuran. 4,153,716, Cl. 424-274.000.

Schiedrum, Hans O.: *See—*
Albert, Walter; Dicks, Manfred; and Schiedrum, Hans O., 4,153,408, Cl. 425-532.000.

Schiessler, Siegfried; Spietschka, Ernst; and Zunker, Reinhard, to Hoechst Aktiengesellschaft. Process for the preparation of a N,N'-dimethyl-perylene-3,4,9,10-tetracarboxylic acid dlimide pigment. 4,153,602, Cl. 546-37.000.

Schloemann-Siemag Aktiengesellschaft: *See—*
Bald, Wilfried; and Polking, Hans, 4,152,919, Cl. 72-250.000.

Schlumberger, Horst D.: *See—*
Schnabel, Eugen; Reinhardt, Gerd; Schlumberger, Horst D.; Truscheit, Ernst; and Tschesche, Harold, 4,153,687, Cl. 424-177.000.

Schmid, Max: *See—*
Barner, Richard; and Schmid, Max, 4,153,614, Cl. 260-340.90R.

Schmidt, Karl-Heinz: *See—*
Vomhof, Paul; Reiss, Adam; and Schmidt, Karl-Heinz, 4,153,208, Cl. 241-82.400.

Schmidt, Lewis W., to Blackwelders. Lid unit for a refuse compactor. 4,152,979, Cl. 100-53.000.

Schmidt, Oskar; and Sibral, Walter, to Lim Holding, S.A. Polyethers having terminal amino groups. 4,153,801, Cl. 548-312.000.

Schmiechen, Ralph: *See—*
Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gert; and Wachtel, Helmut, 4,153,713, Cl. 424-274.000.

Schmitz, William D.; Turpin, Richard H.; Dashiell, Robert A.; and Hadley, Chris L., to Reliance Electric Company. Energy management system. 4,153,936, Cl. 364-493.000.

Schnabel, Eugen; Reinhardt, Gerd; Schlumberger, Horst D.; Truscheit, Ernst; and Tschesche, Harold, to Bayer Aktiengesellschaft. Derivatives, having an inhibitory action against protease and an antiphlogistic action, of the trypsin-kallikrein inhibitor obtained from cattle organs (BPTI), their preparation and their use as medicaments. 4,153,687, Cl. 424-177.000.

Schneider, Howard S. Machine for automatically making plaster slurry and dispensing it to dental molds. 4,153,403, Cl. 425-159.000.

Schneider, Louis; and Graham, David E., to GAF Corporation. Herbicidal N-(haloacetyl)-N'-methylenepyrrolidonyl)-2-cycloalkoxyanilines. 4,153,446, Cl. 71-95.000.

Schoenemann, Rudolf: *See—*
Guinomet, Yves; Tenhaven, Ulrich; Wrede, Wilhelm; Schoenemann, Rudolf; Friedemann, Wolfgang; Groschopp, Heinz; and Germscheid, Hans G., 4,152,916, Cl. 72-42.000.

Schreiber, William L.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
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Schreiner, Horst: *See—*
Rothkegel, Bernhard; and Schreiner, Horst, 4,153,755, Cl. 428-569.000.

Schroder, Johann, to U.S. Philips Corporation. Reversible latent heat storage method, and reversible latent heat accumulator. 4,153,105, Cl. 165-104.00S.

Schroeder, Rondon L.: *See—*
Edmond, Tibor O.; Schroeder, Rondon L.; and Smith, Clarence C., 4,153,119, Cl. 175-27.000.

Schroer, Hans: *See—*
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Arlt, Dieter; and Schroer, Hans, 4,153,596, Cl. 260-45.80N.

Schuler, Peter: *See—*
Edelmann, Hermann; Kraft, Peter; Mann, Karlheinz; Schuler, Peter; and Hagen, Alexander, 4,153,513, Cl. 195-103.50R.

Schulte, Harvey L.: *See*—
Hofmeister, Lucien; and Schulte, Harvey L., 4,153,164, Cl. 211-41.000.

Schultz, John T.: *See*—
Bishop, Clifford F.; and Schultz, John T., 4,153,318, Cl. 339-22.00B.

Schulz, Johann G. D.; Onopchenko, Anatoli; and Sabourin, Edward T., to Gulf Research & Development Company. Polyamide resins from dilactones. 4,153,785, Cl. 528-347.000.

Schulze, Wilhelm, to Maschinenbau Greene GmbH & Co KG. Device for severing and feeding to respective reels a web of material wound in a turn-over type winding machine. 4,153,215, Cl. 242-56.00A.

Schutter, Daniel W.: *See*—
Booth, Alfred E.; and Schutter, Daniel W., 4,153,503, Cl. 162-123.000.

Schutze, Detlef-Ingo: *See*—
Hohmann, Walter; and Schutze, Detlef-Ingo, 4,153,608, Cl. 260-316.000.

Schwartz, Robert D., to Union Carbide Corporation. Microbial production of hydroxylated biphenyl compounds. 4,153,509, Cl. 195-51.00R.

Schwarz, Eckhard C. A., to Biax-Fiberfilm Corporation. Process for stretching an impregnated film of material and the microporous product produced thereby. 4,153,751, Cl. 428-304.000.

Schwarz, Hans-Helmut: *See*—
Neumann, Rainer; Schwarz, Hans-Helmut; and Arnold, Karl-Heinz, 4,153,810, Cl. 568-630.000.

Schwerko, Albert P.: *See*—
Herrington, Daniel R.; and Schwerko, Albert P., 4,153,539, Cl. 208-216.00R.

Schwesig, Helmut; Nordsiek, Karl-Heinz; and Kupper, Friedrich-Wilhelm, to Chemische Werke Huels Aktiengesellschaft. Vulcanizable molding compositions. 4,153,772, Cl. 526-308.000.

Schylander, Erik C., to U.S. Philips Corporation. Demagnetization arrangement. 4,153,858, Cl. 315-8.000.

Scientific Drilling Controls: *See*—
Zuvela, Bernard R.; and Teys, Raymond W., 4,153,120, Cl. 175-57.000.

Scott, William J. Pipe joining connection process. 4,152,821, Cl. 29-421.00R.

Seagreaves, George F.: *See*—
Plyler, Robert G.; Seagreaves, George F.; and Suverison, Lyle B., 4,153,319, Cl. 339-75.00P.

Sebenda, Jan: *See*—
Puffr, Rudolf; and Sebenda, Jan, 4,153,582, Cl. 252-511.000.

Seeley, Carl L. & Colene: *See*—
Willis, William M., 4,153,003, Cl. 116-268.000.

Seely, James R., to Stanley Works, The. Method of making and installing trimmable insulated steel faced entry door. 4,152,876, Cl. 52-455.000.

Seemann, Ronald W.; and Bradshaw, Thomas I., to Minnesota Mining and Manufacturing Company. Method for reinforcing or sealing solid structures or for anchoring bolts therein and cartridges for use in such method. 4,153,156, Cl. 206-219.000.

Seki, Mitsuaki: *See*—
Toyomura, Shigeru; Kyogoku, Hiroshi; and Seki, Mitsuaki, 4,152,983, Cl. 101-93.230.

Sekiguchi, Tsunetoshi, to Citizen Watch Co., Ltd. Push button device for watch casing. 4,152,889, Cl. 58-90.00B.

Sekizawa, Hidekazu: *See*—
Minami, Masana; and Sekizawa, Hidekazu, 4,153,336, Cl. 350-162.0SF.

Sellars, Claude A.: *See*—
Hopkins, John W.; and Sellars, Claude A., 4,153,113, Cl. 166-356.000.

Senuma, Mitio: *See*—
Kodaira, Noboru; Tezuka, Nobuo; Senuma, Mitio; Hashimoto, Teiji; Uchidoi, Masanori; and Iura, Yukio, 4,153,360, Cl. 354-241.000.

Serenkov, Valentin J.: *See*—
Tyavlovsky, Mikhail D.; Kundas, Semen P.; Los, Mechislav N.; Serenkov, Valentin J.; and Vyshinsky, Nikolai V., 4,152,914, Cl. 72-38.000.

Serfontein, Willem J., to Schering Corporation. Bismuth complex preparations. 4,153,685, Cl. 424-94.000.

Seri, Kenji: *See*—
Hamazaki, Yasuhiko; Yamamoto, Toshiyuki; Kawabata, Shozo; Seri, Kenji; Sakasai, Masao; Sato, Reiko; and Ishiyama, Nobuo, 4,153,724, Cl. 424-308.000.

Settlemyer, Bernard W., to General Cable Corporation. Emergency standby air drying back-up system. 4,153,434, Cl. 55-163.000.

Seuter, Friedel: *See*—
Horlein, Ulrich; Boshagen, Horst; and Seuter, Friedel, 4,153,702, Cl. 424-267.000.

Seybert, Earl K., to W. R. Grace & Co. Hydrous silica gel containing dentifrice. 4,153,680, Cl. 424-49.000.

Seybold, Guenther: *See*—
Eilingsfeld, Heinz; and Seybold, Guenther, 4,153,607, Cl. 260-306.80F.

Seymour, Claude W. Tire hold-down device. 4,153,188, Cl. 224-42.240.

Sharkitt, Patrick J.: *See*—
Green, Wendel C.; Cunningham, Russell E.; Light, Gordon S.; Sharkitt, Patrick J.; and Webster, Charles W., 4,153,931, Cl. 364-200.000.

Sharma, Prannath. Safety device for a knob controlled door lock. 4,152,911, Cl. 70-416.000.

Sharp Kabushiki Kaisha: *See*—
Hamada, Hiroshi; Nakauchi, Hiroshi; Hishida, Tadanori; and Yano, Kozo, 4,153,344, Cl. 350-357.000.
Kanayama, Yoshio, 4,153,902, Cl. 346-140.00R.
Sato, Takefumi, 4,153,306, Cl. 303-92.000.

Shatalov, Valentin P.: *See*—
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

Shaub, Harold: *See*—
Feng, I-Ming; and Shaub, Harold, 4,152,927, Cl. 73-60.000.

Shaw, Herbert C.: *See*—
Matthews, William G.; and Shaw, Herbert C., 4,153,429, Cl. 55-68.000.

Sheldon, Samuel B., to Nepsco, Inc. Back rest. 4,153,293, Cl. 297-284.000.

Shell Oil Company: *See*—
Ackers, Stanley, 4,153,682, Cl. 424-78.000.
Clayfield, Eric J.; Pinnington, Clive; Cannon, Michael J.; and Sant, Peter, 4,153,419, Cl. 44-23.000.
Olson, Donald C., 4,153,517, Cl. 204-1.00T.
Tieman, Charles H., 4,153,626, Cl. 260-465.00D.
Verloop, Jan; Goetzee, Rudolf C.; and Werner, Erik S. E., 4,153,674, Cl. 423-573.000.

Shelpuk, Benjamin: *See*—
United States of America, National Aeronautics and Space Administration; and Shelpuk, Benjamin, 4,153,476, Cl. 136-89.0PC.

Shen, Kelvin K.; and Belles, Wayne S., to United States Borax & Chemical Corporation. O-amidophenylmorpholine compounds. 4,153,443, Cl. 71-88.000.

Shepard, Francis H., Jr.: *See*—
Grier, William R.; Shepard, Francis H., Jr.; and Arledge, Arthur L., 4,153,940, Cl. 340-711.000.

Sherwood, Edward F.; and Markle, Larry M., to Westinghouse Electric Corp. Wall supported handrail assembly. 4,153,234, Cl. 256-69.000.

Sherwood-Selpac Corporation: *See*—
Trinkwaider, Joseph C., 4,152,848, Cl. 35-29.00B.

Shiba, Kikuo, to Yamanouchi Pharmaceutical Co., Ltd.; and Nippon Rikagakuyakuhin Company, Ltd. Composition for permanent waving. 4,153,681, Cl. 424-72.000.

Shimano Industrial Company Limited: *See*—
Kamikawa, Kiyohide, 4,153,219, Cl. 242-84.51R.

Shinada, Michio: *See*—
Tanizaki, Hiroyuki; and Shinada, Michio, 4,152,872, Cl. 49-214.000.

Shinbo, Katsutoshi: *See*—
Maki, Hideo; Hosokawa, Takanori; and Shinbo, Katsutoshi, 4,153,506, Cl. 176-20.00R.

Shinoda, Masaichi; Nakamura, Tetsuo; and Yamamoto, Minoru, to Fujitsu Limited. Integrated circuit using an insulated gate field effect transistor. 4,153,906, Cl. 357-23.000.

Shinozaki, Satoshi: *See*—
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,153,487, Cl. 148-175.000.

Shinshu Seiki Kabushiki Kaisha: *See*—
Mikoshiba, Hitoshi; and Tezuka, Chikao, 4,152,982, Cl. 101-93.220.

Shionogi & Co., Ltd.: *See*—
Tanida, Hiroshi; and Irie, Tadashi, 4,153,629, Cl. 260-570.8TC.

Shiozaki, Hiroyuki; and Mikami, Masao, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Metal rolling process and mill. 4,152,912, Cl. 72-10.000.

Shipley, Neil J.: *See*—
Diamond, Jack; Shipley, Neil J.; and Smith, John C., 4,153,262, Cl. 280-5.00A.

Shippert, Ronald D. Compound splint and kit. 4,153,051, Cl. 128-89.00R.

Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, to Fuji Photo Film Co., Ltd. Recording method employing a magnetic recording medium. 4,153,920, Cl. 360-55.000.

Shiraishi, Toshiaki: *See*—
Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, 4,153,454, Cl. 75-124.000.

Shirasu, Akira: *See*—
Kawasaki, Koichiro; Okada, Kazushige; Suginaka, Yutaka; Adachi, Tokuichi; and Shirasu, Akira, 4,152,976, Cl. 99-450.100.

Shower Enclosure Service Company: *See*—
Obradovits, Nicholas J., 4,152,790, Cl. 4-149.000.

Shroff, Arvind: *See*—
Grauleau, Didier; Mourier, Jean; Shroff, Arvind; and Villain, Jacques, 4,153,041, Cl. 126-271.000.

Shuffman, Oscar, deceased: *See*—
Ross, Sigmund L.; Shuffman, Oscar, deceased; and Shuffman, Rose, executrix, 4,153,537, Cl. 208-177.000.

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Shulman, Michael H. Spiral-wrap apparatus. 4,152,879, Cl. 53-399.000.

Shumakov, Valery I.; and Lokshin, Moisei A. Artificial heart. 4,152,785, Cl. 3-1.700.

Shuster, Edward J.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
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Shutchenko, Vladimir G.: *See—*
Litvak, Rafael S.; Rannev, Georgy G.; Anash, Shulim A.; Kim, Larisa P.; Pen-Chen-Sek, Alexandr I.; Borkov, Gennady E.; Nikiforov, Anatoly E.; Shutchenko, Vladimir G.; and Tabachnikov, Mikhail M., 4,153,521, Cl. 204-105.00R.

Sibral, Walter: *See—*
Schmidt, Oskar; and Sibral, Walter, 4,153,801, Cl. 548-312.000.

Sidman, Michael D., to Gould Inc. Integral cycling relay. 4,153,870, Cl. 323-18.000.

Siegal, Burton L., to Kiwi Coders Corporation. Rotary marking device for successively imprinting information upon conveyed articles. 4,152,980, Cl. 101-35.000.

Siegfried Aktiengesellschaft: *See—*
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,153,803, Cl. 560-57.000.

Siekanowicz, Wieslaw W.; and Credelle, Thomas L., to RCA Corporation. Proximity focused element scale image display device. 4,153,856, Cl. 313-422.000.

Siemens Aktiengesellschaft: *See—*
Christgau, Hermann; and Bodes, Ulrich, 4,153,854, Cl. 313-101.000.
Gross, Franz, 4,153,859, Cl. 315-3.500.
Navratil, Franz, 4,153,880, Cl. 328-27.000.
Rohmfeld, Josef, 4,153,842, Cl. 250-445.00T.
Rothkegel, Bernhard; and Schreiner, Horst, 4,153,755, Cl. 428-569.000.

Sigg, Hans, to Maag Gear-Wheel Machine Company Limited. Marine gear drives. 4,153,002, Cl. 115-900.000.

Sigma Systems Inc.: *See—*
Green, Wendel C.; Cunningham, Russell E.; Light, Gordon S.; Sharkitt, Patrick J.; and Webster, Charles W., 4,153,931, Cl. 364-200.000.

Sigmaform Corporation: *See—*
Young, Richard A.; and Stanek, Mark J., 4,153,747, Cl. 428-40.000.

Signode Corporation: *See—*
Annis, James R., 4,153,499, Cl. 156-494.000.

Sill, Richard C.: *See—*
Blieden, Harry R.; and Sill, Richard C., 4,153,813, Cl. 136-89.0PC.

Silver, Alexander; and Wenban, James R., to Garrett Corporation, The. Foil bearing stiffener. 4,153,315, Cl. 308-9.000.

Silver, Jules; and Silverstein, Jerome, to said Jules Silver, by said Jerome Silverstein. Syringe with removable length adjusting member. 4,153,056, Cl. 128-234.000.

Silverstein, Jerome: *See—*
Silver, Jules; and Silverstein, Jerome, 4,153,056, Cl. 128-234.000.

Simm, Walter, to AGFA-Gevaert A.G. Method of altering the gradation in electrostatic recording of half-tone images. 4,153,836, Cl. 250-325.000.

Simons, Elliott S.: *See—*
Gatzke, Ronald D.; Larsen, James L.; and Simons, Elliott S., 4,153,049, Cl. 128-419.00D.

Singer Company, The: *See—*
Batson, William A., 4,152,961, Cl. 83-471.300.
Ljung, Bo H. G.; and Koper, James G., 4,153,317, Cl. 316-19.000.

Sisenca S.A.: *See—*
Ohlsson, Jarl-Erik S. I., 4,153,276, Cl. 281-21.00R.

SKF Industrial Trading and Development Company: *See—*
Huber, Wolfgang; and Marx, Anton, 4,153,258, Cl. 277-56.000.

Slagel, Edwin C., to Goodyear Aerospace Corporation. Polyurethane and method of making. 4,153,777, Cl. 528-60.000.

Slenkovich, Geoge L., to Itek Corporation. Event marker having extremely small bit storage requirements. 4,153,951, Cl. 365-239.000.

Slezak, Adolf: *See—*
Kakac, Karel; Slezak, Adolf; and Janda, Jaroslav, 4,153,226, Cl. 248-20.000.

Smahlik, Michael A., to Steccone Products Co., Inc. Scrubbing attachment for a squeegee. 4,152,807, Cl. 15-246.000.

Smith, Charles L.: *See—*
Minnick, Leonard J.; Webster, William C.; and Smith, Charles L., 4,153,655, Cl. 264-8.000.

Smith, Clarence C.: *See—*
Edmond, Tibor O.; Schroeder, Rondon L.; and Smith, Clarence C., 4,153,119, Cl. 175-27.000.

Smith, J. Lindley, Jr., to Outboard Marine Corporation. Telltale damage indicator for shipping cartons. 4,153,159, Cl. 206-319.000.

Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., to Westinghouse Electric Corp. Organo-sulfur composition for forming thermoparticulating coating. 4,153,740, Cl. 427-8.000.

Smith, John C.: *See—*
Diamond, Jack; Shipley, Neil J.; and Smith, John C., 4,153,262, Cl. 280-5.00A.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,153,704, Cl. 424-270.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,153,793, Cl. 544-320.000.

Smith, Richard G.: *See—*
Lau, Chun-Lim; and Smith, Richard G., 4,153,835, Cl. 250-214.00C.

Smith, Robert L.: *See—*
Gorring, Robert L.; and Smith, Robert L., 4,153,540, Cl. 208-89.000.

Smith, Roderick A.: *See—*
Chaplin, George B. B.; Smith, Roderick A.; and Bearcroft, Robert G., 4,153,815, Cl. 179-1.00P.

Smith, William L., to Dow Chemical Company, The. Compositions comprising phosphate salts of poly-2-oxazoline and fire retardant formulations. 4,153,466, Cl. 106-15.050.

SmithKline Corporation: *See—*
Bender, Paul E.; and Hill, David T., 4,153,706, Cl. 424-270.000.
Resnick, Theodore M., 4,153,720, Cl. 424-283.000.

Smiths Industries Limited: *See—*
Hall, Patrick; and Walker, Peter F., 4,152,970, Cl. 91-318.000.

Sobolev, Valerian M.: *See—*
Glukhovskoi, Vladimir S.; Afanasov, Fedor P.; Shatalov, Valentin P.; Kharitonov, Alexandr G.; Rivin, Ervin M.; Tsybin, Jury S.; Kulakova, Klavdia A.; Dolgoplosk, Boris A.; Sobolev, Valerian M.; Kotov, Valery P.; Polyakov, Vasily V.; Garshin, Anatoly P.; Fil, Vyacheslav G.; Efremov, Stanislav V.; Mitin, Ivan P.; Kozlov, Vasily F.; Gantmakher, Anna R.; Polyakov, Dmitry K.; Arest-Yakubovich, Alexandr A.; and Basova, Raisa V., 4,153,647, Cl. 260-880.00R.

S.A. des Anciens Etablissements Paul Wurth: *See—*
Mahr, Rene N.; and Cimenti, Giovanni, 4,153,140, Cl. 184-6.000.

Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Burgert, Albert, 4,153,814, Cl. 178-68.000.

s.a. Texaco Belgium n.v.: *See—*
de Vleesschauwer, Walter F.; and Molyneux, Alan, 4,153,637, Cl. 585-405.000.

Societe de Conditionnements en Aluminium Scal: *See—*
Chateau, Jean-Marie; Tavernier, Marc; and Descous, Paul, 4,153,101, Cl. 164-428.000.

Societe Nationale Industrielle Aerospatiale: *See—*
Frechou, Georges; and Carriere, Pierre, 4,153,069, Cl. 137-238.000.

Societe Nouvelle des Filtres Philippe: *See—*
Lautrette, Jean-Claude, 4,153,550, Cl. 210-66.000.

Sokolov, Gennady I.: *See—*
Alshits, Mark Z.; Kalugin, Anatoly A.; Sokolov, Gennady I.; and Kovalev, Evgeny P., 4,152,850, Cl. 37-97.000.

Soland, Bruno. Ground covering with adjoining plates. 4,152,875, Cl. 52-227.000.

Somifra (Societe d'Outillage et de Mecanique de l'Ile-de France): *See—*
Fernique, Bernard, 4,153,180, Cl. 222-56.000.

Sommer Exploitation: *See—*
Piquilloud, Pierre C., 4,153,750, Cl. 428-107.000.

Sono-Tek Corporation: *See—*
Berger, Harvey L.; and Brandow, Charles R., 4,153,201, Cl. 239-102.000.

Sonoda, Noriaki; and Koike, Kiyoshi, to Nihon Radiator Co., Ltd. (Nihon Rajieeta Kabushiki Kaisha). Parallel flow type evaporator. 4,153,106, Cl. 165-174.000.

Sony Corporation: *See—*
Isono, Katsuo; and Sanada, Seiji, 4,153,911, Cl. 358-10.000.

Sound Attenuators Limited: *See—*
Chaplin, George B. B.; Smith, Roderick A.; and Bearcroft, Robert G., 4,153,815, Cl. 179-1.00P.

Spangenberg, Peter E.: *See—*
Falbel, Gerald; and Spangenberg, Peter E., 4,153,368, Cl. 356-225.000.

Spanier, Henry C.: *See—*
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,153,738, Cl. 426-656.000.

Sparling, Michael F. Carrying device for a generally rectilinear article. 4,153,285, Cl. 294-15.000.

Spector, George: *See—*
King, William L.; King, William U.; and Spector, George, 4,153,088, Cl. 144-193.00A.

Speedy, Guido C., to General Motors Corporation. Motor vehicle tail lamp assembly. 4,153,928, Cl. 362-331.000.

Sperry Rand Corporation: *See—*
Cozine, Mark L.; Komancheck, John J.; and Riffanacht, John D., 4,153,436, Cl. 55-290.000.

Spezialfabrik moderner Pumpen Ernst Vogel: *See—*
Riefenthaler, Johann, 4,153,385, Cl. 415-53.00R.

Spietschka, Ernst: *See—*
Schiessler, Siegfried; Spietschka, Ernst; and Zunker, Reinhard, 4,153,602, Cl. 546-37.000.

Spisz, Albert S.; and Woods, Daniel J., to Burroughs Corporation. Paper feed tractor locking apparatus. 4,153,142, Cl. 188-75.000.

Sprecker, Mark A.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,811, Cl. 568-820.000.

Sprimag Spritzmaschinenbau GmbH: *See—*
Mueller, Helmut, 4,153,382, Cl. 408-10.000.

Spring, David J.: *See*—
Rowsell, David G.; Spring, David J.; and Hems, Roger, 4,153,679, Cl. 424-45.000.
Square D Company: *See*—
Bishop, Clifford F.; and Schultz, John T., 4,153,318, Cl. 339-22.00B.
Srinivasan, Gurumakonda R., to International Business Machines Corporation. Silicon tetrachloride epitaxial process for producing very sharp autodoping profiles and very low defect densities on substrates with high concentration buried impurity layers utilizing a preheating in hydrogen. 4,153,486, Cl. 148-175.000.
Stadler, Eberhard: *See*—
Knothe, Erich; Berg, Christoph; Stadler, Eberhard; and Kohne, Hans-Heinrich, 4,153,126, Cl. 177-229.000.
Stahl, Dieter; and Puchel, Ernst, to Hoechst Aktiengesellschaft. Process for preparing foamed gypsum and constructional elements composed thereof. 4,153,470, Cl. 106-116.000.
Stamicarbon, B.V.: *See*—
Geurts, Gerardus A.; and Goettsch, Reijer, 4,153,600, Cl. 260-239.30A.
Stamm, David A.: *See*—
Blume, Henry M., Jr.; Stamm, David A.; and Budde, David L., 4,153,933, Cl. 364-200.000.
Stanadyne, Inc.: *See*—
Behnke, Robert C., 4,153,017, Cl. 123-90.510.
Standard Oil Company, The: *See*—
Herrington, Daniel R.; and Schwerko, Albert P., 4,153,539, Cl. 208-216.00R.
Li, George S.; and Jones, John F., 4,153,648, Cl. 260-896.000.
Standard Oil Company (Indiana): *See*—
Vasalos, Iacovos A., 4,153,534, Cl. 208-120.000.
Vasalos, Iacovos A.; Ford, William D.; and Hsieh, Chuan-Kang R., 4,153,535, Cl. 208-120.000.
Stanek, Mark J.: *See*—
Young, Richard A.; and Stanek, Mark J., 4,153,747, Cl. 428-40.000.
Stanley Works, The: *See*—
Seely, James R., 4,152,876, Cl. 52-455.000.
Stansberry, Robert F. Saw horse construction. 4,152,834, Cl. 182-155.000.
Staples, Jon T.: *See*—
Neuberger, Dan; and Staples, Jon T., 4,153,459, Cl. 96-73.000.
Starich, Donald V.: *See*—
Laubenstein, Allan E.; Starich, Donald V.; and Brown, Mitchell L., 4,153,019, Cl. 123-117.00R.
Starogardzkie Zaklady Farmaceutyczne POLFA: *See*—
Brzozowski, Zdzislaw; Magielka, Stanislaw; Angielski, Stefan; Janicki, Stanislaw; Wojcikowski, Czeslaw; and Jakubowski, Zenon, 4,153,710, Cl. 424-273.00P.
Staugaard, Kenneth: *See*—
Sapino, Anthony P.; Swatik, Donald S.; Costello, Robert E.; Malakian, Vahe H.; and Staugaard, Kenneth, 4,152,981, Cl. 101-93.010.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., to Chevron Research Company. Process for soldering using a phosphorus-containing liquid flux. 4,153,482, Cl. 148-23.000.
Steccone Products Co., Inc.: *See*—
Smahlik, Michael A., 4,152,807, Cl. 15-246.000.
Stedman, Robert N.; and Gee, James E., to Caterpillar Tractor Co. Ripping apparatus. 4,152,991, Cl. 104-7.00R.
Steffen, Ulrich; Alberts, Heinrich; and Prinz, Richard, to Bayer Aktiengesellschaft. Graft copolymers. 4,153,646, Cl. 260-878.00R.
Steinhauer, Glenn A.: *See*—
Dittmann, Larry E.; Millhimes, Wayne L.; and Steinhauer, Glenn A., 4,153,406, Cl. 425-438.000.
Steinmetzer, Herbert: *See*—
Lauterberg, Werner; Steinmetzer, Herbert; Weber, Brigitte; Haack, Dieter; and Taube, Werner, 4,153,762, Cl. 521-53.000.
Stephan, Wolfgang, to Biotest-Serum-Institut GmbH. Galenic immunoglobulin preparation. 4,153,683, Cl. 424-85.000.
Sterling Drug Inc.: *See*—
Crounse, Nathan N., 4,153,598, Cl. 260-185.000.
Diana, Guy D., 4,153,719, Cl. 424-282.000.
John, Philip M., 4,153,677, Cl. 424-19.000.
Stern, Richard M.: *See*—
Scherrer, Robert A.; Hammar, Walton J.; and Stern, Richard M., 4,153,716, Cl. 424-274.000.
Stiasny, Carl-Heinz, to Birfield Trasmissioni S.p.A. Flame breaker for industrial furnace heating element. 4,153,035, Cl. 126-91.00A.
Stille, Larry L., to David Manufacturing Co. Grain dryer control system. 4,152,840, Cl. 34-56.000.
Stockl, Friedrich, to Vockenhuber, Karl; and Raimund, Hauser. Motion-picture camera. 4,153,351, Cl. 352-91.00C.
Stockman, Richard F., to Air Preheater Company, Inc., The. Rotor post. 4,153,102, Cl. 165-8.000.
Stolley, Dieter: *See*—
Lemburg, Jorn-Uwe; and Stolley, Dieter, 4,153,081, Cl. 140-92.700.
Storage Technology Corporation: *See*—
Morgan, Willam A., 4,153,816, Cl. 179-15.0AS.
Stork, Harald: *See*—
Wolff, Hans P.; Witte, Ernst-Christian; Thiel, Max; Stork, Harald; and Roesch, Egon, 4,153,728, Cl. 424-319.000.
Stout, Garry A.; and Chestnut, Benjamin F., to P. R. Mallory & Co. Inc. Timing mechanism with coaxial drive system. 4,152,954, Cl. 74-575.000.
Stoychoff, Terry A., to J. I. Case Company. Accumulator mechanism for tree harvesting apparatus. 4,153,087, Cl. 144-34.00E.
Stream, Ralph M., to Owens-Corning Fiberglas Corporation. Method and apparatus for controlling the viscosity of glass streams. 4,153,438, Cl. 65-2.000.
Stroman, Fritz: *See*—
Kleemann, Axel; Klingler, Karl H.; von Schlichtegroll, Ansgar; Stroman, Fritz; Thiemer, Klaus; and Westermann, Erik, 4,153,696, Cl. 424-253.000.
Stromberg-Carlson Corporation: *See*—
D'Ortenzio, Remo J., 4,153,817, Cl. 179-18.0BC.
Studiengesellschaft Kohle mbH: *See*—
Roselius, Wilhelm; Vitzthum, Otto; and Hubert, Peter, 4,153,063, Cl. 131-143.000.
Stumpf, Friedrich: *See*—
Borowski, Kurt; Stumpf, Friedrich; and Huber, Theodor, 4,153,352, Cl. 352-91.00C.
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., to Emery Industries, Inc.; and Reynolds Metals Company. Prevention of water staining of aluminum. 4,153,464, Cl. 106-14.270.
Su, Kai C.: *See*—
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., 4,153,641, Cl. 260-827.000.
Su, Tien K.: *See*—
Kluger, Edward W.; Miley, John W.; and Su, Tien K., 4,153,567, Cl. 252-51.50A.
Succursale de Collonge Bellerive: *See*—
Weber, Eugen, 4,153,149, Cl. 192-95.000.
Suda, Kataro, to Suda Kinzoku Seisakusho Co., Ltd. Electrically driven travelling toy. 4,152,866, Cl. 46-251.000.
Suda Kinzoku Seisakusho Co., Ltd.: *See*—
Suda, Kataro, 4,152,866, Cl. 46-251.000.
Sudduth, Jerome R.: *See*—
Keyworth, Donald A.; and Sudduth, Jerome R., 4,153,452, Cl. 75-101.0BE.
Keyworth, Donald A.; and Sudduth, Jerome R., 4,153,669, Cl. 423-24.000.
Suginaka, Yutaka: *See*—
Kawasaki, Koichiro; Okada, Kazushige; Suginaka, Yutaka; Adachi, Tokuichi; and Shirasu, Akira, 4,152,976, Cl. 99-450.100.
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, to Mitsubishi Gas Chemical Company, Inc. Resin composition containing polyphenylene oxide. 4,153,644, Cl. 260-876.00B.
Sugiyama, Jin, to UNITECH Engineering Ltd. Frame positioning device for automatic stitching apparatus. 4,152,994, Cl. 112-121.120.
Sullivan, Richard A. Aerodynamic disc. 4,153,252, Cl. 273-106.00B.
Sulzer Brothers Limited: *See*—
Naegeli, John P.; and Maurer, Andreas, 4,153,388, Cl. 416-61.000.
Sumitomo Chemical Company, Limited: *See*—
Hibino, Toshihiko; and Murayama, Eiichi, 4,153,610, Cl. 260-332.20C.
Summers, Jack C.; and Hegedus, Louis, to General Motors Corporation. Platinum, rhodium, and palladium catalyst for automotive emission control. 4,153,579, Cl. 252-462.000.
Sundberg, Erik G.; Campbell, George A.; and Doucette, Edward I., to Aktiebolaget Tudor. Microporous plastic member such as a battery separator and process for making same. 4,153,760, Cl. 429-252.000.
Supalla, Steven A. Hydrapneumatic suspension unit and valving structure. 4,153,237, Cl. 267-64.00R.
Superior Electric Company, The: *See*—
Leenhouts, Albert C., 4,153,866, Cl. 318-696.000.
Suverison, Lyle B.: *See*—
Plyler, Robert G.; Seagreaves, George F.; and Suverison, Lyle B., 4,153,319, Cl. 339-75.00P.
Suzuki, Kensuke: *See*—
Itoh, Seiichi; and Suzuki, Kensuke, 4,153,910, Cl. 357-68.000.
Suzuki, Koichi; and Suzuki, Shigeru, to Ricoh Company, Ltd. Exposure and development control apparatus for electrostatic copying machine. 4,153,364, Cl. 355-14.000.
Suzuki, Masaaki: *See*—
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, 4,153,920, Cl. 360-55.000.
Suzuki, Satosi: *See*—
Nagano, Masami; and Suzuki, Satosi, 4,153,026, Cl. 123-139.0AW.
Suzuki, Shigeru: *See*—
Suzuki, Koichi; and Suzuki, Shigeru, 4,153,364, Cl. 355-14.000.
Suzuki, Shigeto, to Chevron Research Company. Extractive separation of glycolic acid from diglycolic acid. 4,153,809, Cl. 562-583.000.
Suzuki, Yoshihiro; Minakawa, Tadashi; and Asai, Osamu, to Hitachi, Ltd. Silver-electroplating method using thiocyanic solution. 4,153,519, Cl. 204-40.000.
Swanson, Roy T., to S&C Electric Company. End fitting for high-voltage fuse. 4,153,893, Cl. 337-201.000.
Swatik, Donald S.: *See*—
Sapino, Anthony P.; Swatik, Donald S.; Costello, Robert E.; Malakian, Vahe H.; and Staugaard, Kenneth, 4,152,981, Cl. 101-93.010.
Sweet, Charles R., to Bendix Corporation, The. Peripheral circuitry for single-point fuel injection. 4,153,014, Cl. 123-32.0EA.
Swift, David W., to Pilkington P.E. Limited. Head-up displays. 4,153,913, Cl. 358-93.000.
Swift, Harold E.: *See*—
Bercik, Paul G.; Swift, Harold E.; and Metzger, Kirk J., 4,153,638, Cl. 585-526.000.
Wu, Ching-Yong; Swift, Harold E.; and Bozik, John E., 4,153,635, Cl. 568-574.000.

Swift, Kenneth J., to Markem Corporation. Label manufacturing apparatus. 4,153,496, Cl. 156-384.000.

Swisher, James A., to C. Cowles & Company. Meter box guard lock. 4,152,910, Cl. 70-159.000.

Swiss, William R.; and Young, Wayne S., to International Business Machines Corporation. Accelerated sintering for a green ceramic sheet. 4,153,491, Cl. 156-89.000.

Szescila, Andrew J., to Baker International Corporation. Method and apparatus for anchoring whipstocks in well bores. 4,153,109, Cl. 166-250.000.

Szmuszkovicz, Jacob, to Upjohn Company, The. Analgesic N-(2-(furylmethylamino and 2 -thienylmethylamino)cyclo aliphatic)benzamides. 4,153,717, Cl. 424-275.000.

Tabachnikov, Mikhail M.: *See*—
Litvak, Rafael S.; Rannev, Georgy G.; Anash, Shulim A.; Kim, Larisa P.; Pen-Chen-Sek, Alexandr I.; Borkov, Gennady E.; Nikiforov, Anatoly E.; Shutchenko, Vladimir G.; and Tabachnikov, Mikhail M., 4,153,521, Cl. 204-105.00R.

Tabei, Kiyoshi: *See*—
Araki, Kunio; Sasaki, Takashi; Tabei, Kiyoshi; and Goto, Kazuo, 4,153,525, Cl. 204-159.150.

Tabor, Jewel F. Nut cracker table. 4,153,238, Cl. 269-15.000.

Tabuchi, Hiroshi: *See*—
Oshima, Masanao; Tabuchi, Hiroshi; and Inokawa, Tsuneo, 4,152,999, Cl. 114-42.000.

Tada, Tetsuya. Trigger type sprayer. 4,153,203, Cl. 239-333.000.

Tagami, Sanae: *See*—
Narita, Yoshihiro; Konuma, Hideo; Tagami, Sanae; and Yamada, Hirosi, 4,153,780, Cl. 528-198.000.

Taiho Kogyo Co., Ltd.: *See*—
Iwahana, Keiichi; Mathuda, Yoshimi; and Futamura, Kenichiro, 4,153,756, Cl. 428-653.000.

Tajima, Akira; and Kawamura, Naoto, to Canon Kabushiki Kaisha. Zoom lens. 4,153,339, Cl. 350-184.000.

Takada, Shigetaka: *See*—
Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, 4,153,021, Cl. 123-119.0EC.

Takahashi, Tadao. Sectional unit furniture assembly. 4,153,311, Cl. 312-107.000.

Takara Co., Ltd.: *See*—
Ogawa, Iwakichi, 4,152,867, Cl. 46-259.000.

Takeda Chemical Industries, Ltd.: *See*—
Hirai, Shin-Ichiro; Ikenaga, Toshiaki; and Matsuzawa, Tai, 4,153,689, Cl. 424-178.000.
Ishiguro, Toshihiro; and Sanno, Yasushi, 4,153,794, Cl. 544-358.000.

Takenouchi, Naoki: *See*—
Iio, Katsuro; Takenouchi, Naoki; and Yamada, Kimio, 4,153,832, Cl. 219-124.340.

Tam, Richard K. W.: *See*—
Rau, John W., III; Muller, Harold H.; Tam, Richard K. W.; and Kabell, Louis J., 4,153,949, Cl. 365-104.000.

Tanaka, Motoaki: *See*—
Iijima, Toshifumi; Obikawa, Tadahiko; and Tanaka, Motoaki, 4,153,460, Cl. 96-74.000.

Tanaka, Teruaki; and Haruna, Takayuki, to Daido Tokushuko Kabushiki Kaisha. Vertical rolling mill. 4,152,918, Cl. 72-238.000.

Tanida, Hiroshi; and Irie, Tadashi, to Shionogi & Co., Ltd. 9,10-Dihydro-9,10-methanoanthracene N-oxide. 4,153,629, Cl. 260-570.8TC.

Taniwaki, Genshi, to Kongo Co., Ltd. Mobile rack system. 4,153,312, Cl. 312-198.000.

Tanizaki, Hiroyuki; and Shinada, Michio, to Nissan Motor Company, Limited. Sliding mechanism for vehicle sliding door. 4,152,872, Cl. 49-214.000.

Tanner, Robert G., to Arundale, Inc. Multipart hub assembly. 4,153,303, Cl. 301-63.0PW.

Tanno, Shogo: *See*—
Hashimoto, Makoto; Tomita, Yoshio; Nagatsuna, Fumio; Hirose, Masateru; and Tanno, Shogo, 4,153,179, Cl. 221-1.000.

Tanso, Shiro: *See*—
Murata, Kazuo; Tanso, Shiro; and Yamao, Junzo, 4,153,759, Cl. 429-147.000.

Tasch, Al F., Jr.; Fu, Horng-Sen; Chatterjee, Pallab K.; and Hiller, William E., to Texas Instruments Incorporated. Semiconductor device having a high breakdown voltage junction characteristic. 4,153,904, Cl. 357-13.000.

Tatarinsev, Vladimir M.: *See*—
Alexandrov, Vladimir I.; Osiko, Vyacheslav V.; Tatarinsev, Vladimir M.; and Udovenchik, Viktor T., 4,153,469, Cl. 106-42.000.

Taube, Werner: *See*—
Lauterberg, Werner; Steinmetzer, Herbert; Weber, Brigitte; Haack, Dieter; and Taube, Werner, 4,153,762, Cl. 521-53.000.

Tauber, Carl F., Jr., to Zullo, Leonard F. Gymnastic set for wheelchair patients. 4,153,244, Cl. 272-117.000.

Tavernier, Marc: *See*—
Chateau, Jean-Marie; Tavernier, Marc; and Descous, Paul, 4,153,101, Cl. 164-428.000.

Taylor, Charles F.; and Taylor, Richard J. Slip sheet retaining clip. 4,153,161, Cl. 206-386.000.

Taylor, David L.; and Harris, Stephen A., to Harris Corporation. Electrically alterable amplifier configurations. 4,153,883, Cl. 330-262.000.

Taylor, Edward W.: *See*—
Norton, Delwyn E.; and Taylor, Edward W., 4,153,005, Cl. 118-49.100.

Taylor, John C. Method for forming snap-acting thermally responsive actuators. 4,152,998, Cl. 113-119.000.

Taylor, John W., Jr., to Westinghouse Electric Corp. MTI radar system and method. 4,153,899, Cl. 343-7.700.

Taylor, Richard J.: *See*—
Taylor, Charles F.; and Taylor, Richard J., 4,153,161, Cl. 206-386.000.

Technicon Instruments Corporation: *See*—
Watts, Leonard, 4,153,098, Cl. 164-83.000.

Teijin Limited: *See*—
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Tsuruta, Hideki; Yamamoto, Mamoru; and Kato, Kenichi, 4,153,630, Cl. 260-578.000.

Tektronix, Inc.: *See*—
Holmes, Robert E.; and Zimmerman, Robert R., 4,153,518, Cl. 204-38.00B.

Tenhaven, Ulrich: *See*—
Guinomet, Yves; Tenhaven, Ulrich; Wrede, Wilhelm; Schoenemann, Rudolf; Friedemann, Wolfgang; Groschopp, Heinz; and Germscheid, Hans G., 4,152,916, Cl. 72-42.000.

Tenneco Chemicals, Inc.: *See*—
Keyworth, Donald A.; and Sudduth, Jerome R., 4,153,452, Cl. 75-101.0BE.
Keyworth, Donald A.; and Sudduth, Jerome R., 4,153,669, Cl. 423-24.000.

Tennichi, Yasuhiro: *See*—
Eki, Yurio; Tennichi, Yasuhiro; and Honda, Naganobu, 4,153,198, Cl. 235-303.300.

Teraguchi, Susumu: *See*—
Okada, Katsuto; Yamamoto, Hideo; Teraguchi, Susumu; and Ishibashi, Norio, 4,153,544, Cl. 210-12.000.

Terra Tek, Inc.: *See*—
Abou-Sayed, Ahmed S.; and Jones, Arfon H., 4,152,941, Cl. 73-799.000.

Tessler, Martin M., to National Starch and Chemical Corporation. Starch ether derivatives and process for the preparation thereof. 4,153,585, Cl. 260-17.4GC.

Texaco Inc.: *See*—
Kalfoglou, George; and Flournoy, Kenoth H., 4,153,573, Cl. 252-312.000.
Kalfoglou, George; and Flournoy, Kenoth H., 4,153,575, Cl. 252-352.000.
Powell, Justin C.; and Cummings, William M., 4,153,616, Cl. 260-343.500.

Texaco Trinidad, Inc.: *See*—
Lans, Kenneth I. T.; and Ross, Desmond E., 4,153,111, Cl. 166-315.000.

Texas Instruments Incorporated: *See*—
Cochran, Michael J., 4,153,876, Cl. 325-15.000.
Poland, Sydney W., 4,153,937, Cl. 364-706.000.
Tasch, Al F., Jr.; Fu, Horng-Sen; Chatterjee, Pallab K.; and Hiller, William E., 4,153,904, Cl. 357-13.000.

Textron Inc.: *See*—
Moertel, George B.; and Johnston, James R., 4,153,489, Cl. 156-73.300.
Van Amburg, William F., 4,152,996, Cl. 112-262.300.

Teys, Raymond W.: *See*—
Zuvela, Bernard R.; and Teys, Raymond W., 4,153,120, Cl. 175-57.000.

Tezuka, Chikao: *See*—
Mikoshiba, Hitoshi; and Tezuka, Chikao, 4,152,982, Cl. 101-93.220.

Tezuka, Nobuo: *See*—
Kodaira, Noboru; Tezuka, Nobuo; Senuma, Mitio; Hashimoto, Teiji; Uchidoi, Masanori; and Iura, Yukio, 4,153,360, Cl. 354-241.000.

Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., to Exxon Research & Engineering Co. High molecular weight high unsaturation C_4-C_{10} isoolefin conjugated diolefin copolymers and multipolymers containing methylcyclopentadiene. 4,153,584, Cl. 260-5.000.

Thaler, Warren A.: *See*—
Buckley, Donald J.; Thaler, Warren A.; and Kennedy, Joseph P., 4,153,773, Cl. 526-308.000.

Than, Maung M. Kite reel. 4,153,222, Cl. 242-96.000.

Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft, m.b.H. Mobile apparatus for continuously laying ties. 4,152,989, Cl. 104-2.000.

Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track tie transport apparatus. 4,152,990, Cl. 104-6.000.

Thiel, Max: *See*—
Wolff, Hans P.; Witte, Ernst-Christian; Thiel, Max; Stork, Harald; and Roesch, Egon, 4,153,728, Cl. 424-319.000.

Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, to Siegfried Aktiengesellschaft. Cholesterol-lowering phenoxyalkanoic acid esters. 4,153,803, Cl. 560-57.000.

Thielen, Gunter: *See*—
Fink, Peter; Wild, Hans; Zizlsperger, Johann; Reffert, Rudi W.; and Thielen, Gunter, 4,153,501, Cl. 159-49.000.

Thiemer, Klaus: *See*—
Kleemann, Axel; Klingler, Karl H.; von Schlichtegroll, Ansgar; Stroman, Fritz; Thiemer, Klaus; and Westermann, Erik, 4,153,696, Cl. 424-253.000.

Thierer, Georg; and Dolinsek, Hans, to Johannes Fuchs, Firma. Scraper. 4,153,165, Cl. 414-133.000.

Thillier, Robert; and Vaginay, Yves, to Rhone-Poulenc-Textile. Method of producing polyesters. 4,153,781, Cl. 528-274.000.

Thompson, David B., to Otis Engineering Corporation. Pilot valve. 4,153,072, Cl. 137-467.000.
Thomson-Brandt: *See—*
Grauleau, Didier; Mourier, Jean; Shroff, Arvind; and Villain, Jacques, 4,153,041, Cl. 126-271.000.
Thomson-CSF: *See—*
Gazard, Maryse; and Dubois, Jean-Claude, 4,153,925, Cl. 361-323.000.
Thornburgh, William F., to General Motors Corporation. Fuel tank vapor flow control valve. 4,153,025, Cl. 123-136.000.
Thornton, John A.; and Compton, Thomas A., to Armco Steel Corporation. Apparatus for finishing molten metallic coatings. 4,153,006, Cl. 118-63.000.
Tieman, Charles H., to Shell Oil Company. Preparation of α-cyanobenzyl esters. 4,153,626, Cl. 260-465.00D.
Tienor, Lawrence J., to National Presto Industries, Inc. Hot air corn popper. 4,152,974, Cl. 99-323.800.
Todt, William H.; and Playfoot, Kerwin C., to Westinghouse Electric Corp. Liquid level sensor. 4,152,937, Cl. 73-290.00R.
Tohma, Hideaki; and Uehara, Kazuo, to Kabushika Kaisha Komatsu Seisakusho. Hydraulic power system with a load-sensing and a cutoff control valve. 4,152,896, Cl. 60-445.000.
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing intergrated injection logic semiconductor devices utilizing self-aligned double-diffusion techniques. 4,153,487, Cl. 148-175.000.
Tokyo Sanyo Electric Co. Ltd.: *See—*
Ikeguchi, Shigehiko; and Yamashita, Norio, 4,153,884, Cl. 331-1.00A.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Minami, Masana; and Sekizawa, Hidekazu, 4,153,336, Cl. 350-162.0SF.
Sato, Masayuki, 4,153,934, Cl. 364-200.000.
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,153,487, Cl. 148-175.000.
Tollinger, James; and Joslyn, Edward P., to Ithaca Gun Company. Trigger mechanism. 4,152,856, Cl. 42-69.00B.
Tomic, Relja; Aberg, Ulf; and Karlsson, Elis, to Rockwool Aktiebolaget. Method for the production of mineral wool, especially for use in basic milieu. 4,153,439, Cl. 65-2.000.
Tomioka, Kenichi: *See—*
Matsui, Hidefumi; Tomioka, Kenichi; Kawada, Hiroitsu; and Maeno, Hiroo, 4,153,727, Cl. 414-317.000.
Tomita, Yoshio: *See—*
Hashimoto, Makoto; Tomita, Yoshio; Nagatsuna, Fumio; Hirose, Masateru; and Tanno, Shogo, 4,153,179, Cl. 221-1.000.
Tomlinson, Walter J., III, to Bell Telephone Laboratories, Incorporated. Single-mode wavelength division optical multiplexer. 4,153,330, Cl. 350-96.170.
Tomura, Teruichi: *See—*
Kato, Yasuo; Komoda, Tsutomu; and Tomura, Teruichi, 4,153,334, Cl. 350-132.000.
Toole, Pierce C.: *See—*
United States of America, National Aeronautics and Space Administration; Goodloe, Radford R.; Toole, Pierce C.; Belt, Jerry L.; and Leininger, Donald B., 4,153,818, Cl. 179-27.0CA.
Torstensson, Tommy, to Forsheda Gummifabrik AB. Shaft sealing arrangement. 4,153,259, Cl. 277-75.000.
Totaro, Charles S.: *See—*
Gersin, Robert P.; Totaro, Charles S.; Gebhardt, Roland; and Khovaylo, Modest, 4,152,803, Cl. 15-104.940.
Tousignant, James N.: *See—*
Harrison, William A.; Hubbard, Winchester L.; Grahme, Robert E., Jr.; and Tousignant, James N., 4,153,703, Cl. 424-270.000.
Towmotor Corporation: *See—*
Diamond, Jack; Shipley, Neil J.; and Smith, John C., 4,153,262, Cl. 280-5.00A.
Townshend, Maurice P., to Plessey Handel und Investments AG. Connector for a cable, hose or the like. 4,153,320, Cl. 339-91.00B.
Towsend, Marvin S. Shovel blade. 4,153,287, Cl. 294-51.000.
Toyoda, Tsunehiko: *See—*
Yano, Hirofumi; Okamura, Noriaki; and Toyoda, Tsunehiko, 4,153,467, Cl. 106-20.000.
Toyomura, Shigeru; Kyogoku, Hiroshi; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Printing hammer driving system. 4,152,983, Cl. 101-93.230.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hattori, Kyo, 4,153,650, Cl. 261-41.00D.
Ikegaya, Seiji, 4,153,029, Cl. 123-141.000.
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Tragert, William E., to National Patent Development Corp. Solar collector. 4,153,042, Cl. 126-271.000.
Trahan, Richard J.: *See—*
Pounds, Steve R.; Young, Carter R.; and Trahan, Richard J., 4,153,108, Cl. 166-118.000.
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Dits, Herbert R., 4,152,921, Cl. 72-441.000.
Treptow, Wolfram: *See—*
Boehn, Hugo; Treptow, Wolfram; Wunsch, Gerd; Kiener, Volker; Meyer, Hermann; and Csizi, Gotthard, 4,153,742, Cl. 427-126.000.
Triggs, Charles W.: *See—*
Pizzuti, Donato F.; and Triggs, Charles W., 4,153,903, Cl. 354-195.000.
Trinkwalder, Joseph C., to Sherwood-Selpac Corporation. Life support training device. 4,152,848, Cl. 35-29.00B.
Trio Kabushiki Kaisha: *See—*
Sakaida, Kaku, 4,153,879, Cl. 325-478.000.
Triolo, Louis J., to Amerace Corporation. Thermoplastic elastomeric molding composition and articles molded therefrom. 4,153,589, Cl. 260-28.50B.
Trommsdorff, Wolf: *See—*
Romer, Rudolf; Trommsdorff, Wolf; and Jaeneke, Christian, 4,153,223, Cl. 244-3.100.
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Tschesche, Harold: *See—*
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Rumyantsev, Leonid A.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,152,894, Cl. 60-347.000.
Tsuchitani, Tadayasu: *See—*
Baba, Toshihiko; Uomori, Akiyoshi; and Tsuchitani, Tadayasu, 4,153,830, Cl. 219-101.000.
Tsujimoto, Nobuhiro: *See—*
Ueno, Haruo; Oizumi, Kyohei; Ishikawa, Hideo; Nakajima, Kohei; Tsujimoto, Nobuhiro; Kimura Osamu; and Aikawa, Hideyuki, 4,153,767, Cl. 526-141.000.
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Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,153,508, Cl. 195-31.00P.
Tsuruta, Hideki: *See—*
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Tsuruta, Hideki; Yamamoto, Mamoru; and Kato, Kenichi, 4,153,630, Cl. 260-578.000.
Tsybin, Jury S.: *See—*
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Tullen Industries Limited: *See—*
Davies, Peter O., 4,152,831, Cl. 30-231.000.
Turbo Refrigerating Company: *See—*
Ottman, Everett S., 4,153,404, Cl. 425-256.000.
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Schmitz, William D.; Turpin, Richard H.; Dashiell, Robert A.; and Hadley, Chris L., 4,153,936, Cl. 364-493.000.
Turri, Eugenio: *See—*
Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio, 4,153,214, Cl. 242-47.010.
Tyavlovsky, Mikhail D.; Kundas, Semen P.; Los, Mechislav N.; Serenkov, Valentin J.; and Vyshinsky, Nikolai V., to Minsky Radiotekhnichesky Institut. Apparatus for production of metal ribbon. 4,152,914, Cl. 72-38.000.
Tyson, John P.: *See—*
DuBiel, Joseph T.; and Tyson, John P., 4,152,855, Cl. 42-16.000.
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Ueno, Haruo; Oizumi, Kyohei; Ishikawa, Hideo; Nakajima, Kohei; Tsujimoto, Nobuhiro; Kimura, Osamu; and Aikawa, Hideyuki, 4,153,767, Cl. 526-141.000.
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Kodaira, Noboru; Tezuka, Nobuo; Senuma, Mitio; Hashimoto, Teiji; Uchidoi, Masanori; and Iura, Yukio, 4,153,360, Cl. 354-241.000.

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Alexandrov, Vladimir I.; Osiko, Vyacheslav V.; Tatarinsev, Vladimir M.; and Udovenchik, Viktor T., 4,153,469, Cl. 106-42.000.
Ueda, Joji; and Fukushima, Hisao, to Oki Electric Industry Co., Ltd. Telephone set. 4,153,822, Cl. 179-103.000.
Uehara, Kazuo: *See—*
Tohma, Hideaki; and Uehara, Kazuo, 4,152,896, Cl. 60-445.000.
Ueno, Haruo; Oizumi, Kyohei; Ishikawa, Hideo; Nakajima, Kohei; Tsujimoto, Nobuhiro; Kimura, Osamu; and Aikawa, Hideyuki, to Ube Industries Limited. Method of producing 1,2-polybutadiene. 4,153,767, Cl. 526-141.000.
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Uhlig, Fritz: *See—*
Berghauser, Gunter; and Uhlig, Fritz, 4,153,461, Cl. 96-75.000.
Uhls, Jimmie J. Air shock apparatus for motorcycles. 4,153,266, Cl. 280-276.000.
Uhrhan, Paul: *See—*
Oertel, Harald; Uhrhan, Paul; Lantzsch, Reinhard; Roos, Ernst; Arlt, Dieter; and Schroer, Hans, 4,153,596, Cl. 260-45.80N.
Uihlein, Michael: *See—*
Hornke, Ingolf; Fehlhaber, Hans-Wolfram; and Uihlein, Michael, 4,153,697, Cl. 424-258.000.
Ukena, Toshinao: *See—*
Ogata, Yuzuru; Kawaguchi, Takeshi; Kinoshita, Ikuya; Nakayama, Hirokazu; and Ukena, Toshinao, 4,153,770, Cl. 526-209.000.
Unger, John C.: *See—*
Dimyan, Magid Y.; and Unger, John C., 4,153,948, Cl. 365-28.000.
Union Carbide Corporation: *See—*
Dunks, Gary B.; and Beard, Charles D., 4,153,672, Cl. 423-287.000.
Kaplan, Leonard; Walker, Wellington E.; and O'Connor, George L., 4,153,623, Cl. 260-449.00L.
Karol, Frederick J.; Wu, Chisung; Reichle, Walter T.; and Maraschin, Norma J., 4,153,576, Cl. 252-428.000.
Matthews, William G.; and Shaw, Herbert C., 4,153,429, Cl. 55-68.000.
Park, Kisoon; Bryant, George M.; and Carr, Frazier G., 4,153,778, Cl. 528-76.000.
Reed, Denvil E.; and Grimm, Richard C., 4,153,516, Cl. 203-64.000.
Saunders, John B.; and Davis, James S., 4,153,428, Cl. 55-26.000.
Schwartz, Robert D., 4,153,509, Cl. 195-51.00R.
Uniroyal, Inc.: *See—*
Harrison, William A.; Hubbard, Winchester L.; Grahme, Robert E., Jr.; and Tousignant, James N., 4,153,703, Cl. 424-270.000.
Sarkissian, Berge, 4,153,095, Cl. 152-340.000.
Wheeler, Edward L.; and Jancis, Elmar H., 4,153,597, Cl. 260-45.85B.
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Harrison, William A.; Hubbard, Winchester L.; Grahme, Robert E., Jr.; and Tousignant, James N., 4,153,703, Cl. 424-270.000.
Uniscope, Inc.: *See—*
Mommer, Richard P., 4,153,735, Cl. 426-285.000.
UNITECH Engineering Ltd.: *See—*
Sugiyama, Jin, 4,152,994, Cl. 112-121.120.
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Mort, Charles B.; and Anthony, Robert E., 4,152,818, Cl. 29-157.30C.
United Catalysts Inc.: *See—*
Hausberger, Arthur L.; and Dienes, Edward K., 4,153,580, Cl. 252-462.000.
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Shen, Kelvin K.; and Belles, Wayne S., 4,153,443, Cl. 71-88.000.
United States Gypsum Company: *See—*
Balinski, Henry A., 4,152,878, Cl. 52-481.000.
O'Neill, Eugene E., 4,153,373, Cl. 366-165.000.
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America: *See—*
Alphonse, Gerard A.; Vilkomerson, David H. R.; and Hurley, Bernard, 4,153,894, Cl. 340-1.00R.
Army: *See—*
Cipkowski, Jerome T., 4,153,169, Cl. 414-442.000.
Clodfelter, Glen A., 4,153,282, Cl. 285-332.300.
Feingold, Robert M., 4,153,855, Cl. 313-105.0CM.
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Kardash, William E., Jr., 4,152,871, Cl. 49-49.000.
Energy: *See—*
Bissett, Larry A.; Friggens, Gary R.; and McGee, James P., 4,153,427, Cl. 48-86.00R.
Corey, Harry S., III, 4,153,370, Cl. 356-358.000.
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King, William H.; Kraus, Bernhard J.; and Belyo, Steven C., 4,153,020, Cl. 123-117.00R.
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Yang, Lien C., 4,153,134, Cl. 181-120.000.
Navy: *See—*
Catano, Paul S.; Monahan, Michael A.; and Bromley, Keith, 4,153,917, Cl. 360-10.000.
Falbel, Gerald; and Spangenberg, Peter E., 4,153,368, Cl. 356-225.000.
Haas, Davey S.; and Helton, Claude D., 4,152,988, Cl. 102-28.00M.
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Lundstrom, Norman H.; and Reed, Russell, Jr., 4,152,987, Cl. 102-6.000.
McKechnie, John C., 4,153,915, Cl. 358-213.000.
Weller, Robert A.; and Davis, Russ E., 4,152,934, Cl. 73-189.000.
U.S. Philips Corporation: *See—*
Huisman, Hendrikus, 4,153,754, Cl. 428-539.000.
Meijer, Albert J.; and Rentema, Albertus P., 4,152,830, Cl. 30-195.000.
Schroder, Johann, 4,153,105, Cl. 165-104.00S.
Schylander, Erik C., 4,153,858, Cl. 315-8.000.
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Green, David T., 4,152,920, Cl. 72-410.000.
United Technical Products, Inc.: *See—*
Klein, William G., 4,153,749, Cl. 428-95.000.
United Technologies Corporation: *See—*
Leogrande, John A.; and Levine, Richard, 4,153,386, Cl. 415-115.000.
Marceau, Daniel J.; and Moriarty, Robert M., 4,153,930, Cl. 363-42.000.
Norton, Delwyn E.; and Taylor, Edward W., 4,153,005, Cl. 118-49.100.
Renzulli, Michael A.; and DelMastro, Fiorentino G., 4,153,831, Cl. 219-121.00P.
Universal Machine Co., Inc.: *See—*
Marion, Thomas E., 4,153,190, Cl. 226-33.000.
University of California, The Regents of the: *See—*
Hammel, Harold T.; and Maggert, James E., 4,153,546, Cl. 210-41.000.
Wang, Shyh, 4,153,328, Cl. 350-96.110.
University of Pennsylvania: *See—*
Korostoff, Edward; and Davidovitch, Zeev, 4,153,060, Cl. 128-419.00F.
University Patents, Inc.: *See—*
Roberts, Richard A., 4,152,928, Cl. 73-61.00R.
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Bender, Hans; Zabel, Wolf; Duren, Gottfried; and Unkelbach, Karl-Heinz, 4,153,542, Cl. 209-223.00R.
Uomori, Akiyoshi: *See—*
Baba, Toshihiko; Uomori, Akiyoshi; and Tsuchitani, Tadayasu, 4,153,830, Cl. 219-101.000.
UOP Inc.: *See—*
Riedinger, Alan B., 4,153,556, Cl. 210-218.000.
Upjohn Company, The: *See—*
McCall, John M., 4,153,612, Cl. 260-333.000.
Moon, Malcolm W., 4,153,707, Cl. 424-272.000.
Szmuszkovicz, Jacob, 4,153,717, Cl. 424-275.000.
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Coester, Erwin; Krapf, Heinz; Pfistermeister, Martin; Sartor, Bruno; and Mohrhauer, Hans, 4,153,480, Cl. 148-6.350.
Urbanowicz, Edward J., to Olin Corporation. Pole extension for powder-actuated tool. 4,153,193, Cl. 227-156.000.
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Foley, Michael S., 4,153,082, Cl. 140-105.000.
Utz, Walter E.: *See—*
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., 4,153,464, Cl. 106-14.270.
Utzinger, William F., to Monarch Marking Systems, Inc. Inking mechanism for printing apparatus. 4,152,984, Cl. 101-292.000.
Vactec, Incorporated: *See—*
Kofron, Vernon K., 4,153,907, Cl. 357-30.000.
Vadetec Corporation: *See—*
Kemper, Yves, 4,152,946, Cl. 74-193.000.
Kemper, Yves J., 4,152,944, Cl. 74-191.000.
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Vaginay, Yves: *See—*
Thillier, Robert; and Vaginay, Yves, 4,153,781, Cl. 528-274.000.
Vainer, Ernesto A. Compact piezoelectric lighter for gas fixtures. 4,153,852, Cl. 310-339.000.
Vallance, Christopher; and Davies, Peter J., to Imperial Chemical Industries Limited. Diaphragm cells. 4,153,530, Cl. 204-252.000.
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van Deursen, Petrus H.; and Ludoph, Hemmo H. J., 4,152,947, Cl. 74-230.17F.
Van Amburg, William F., to Textron Inc. Method for sewing trouserfly units and the like. 4,152,996, Cl. 112-262.300.
van Buren, Martin F.: *See—*
Deichert, William G.; Su, Kai C.; and van Buren, Martin F., 4,153,641, Cl. 260-827.000.
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Van Hook, Brewton O.: *See—*
Rampolla, Robert W.; and Van Hook, Brewton O., 4,153,224, Cl. 244-3.160.

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Vapor Corporation: *See—*
Reddy, Redreddy S., 4,153,826, Cl. 200-44.000.

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Heath, Frederick G., 4,152,789, Cl. 4-146.000.

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Lauterberg, Werner; Steinmetzer, Herbert; Weber, Brigitte; Haack, Dieter; and Taube, Werner, 4,153,762, Cl. 521-53.000.

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Veilleux, Roger L. Flexible container for storing sand. 4,153,089, Cl. 150-7.000.

Vera, Enrique M.: *See—*
MacKay, Patrick W.; Vera, Enrique M.; and de la Pena, Ramon, 4,153,450, Cl. 75-26.000.

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Ahlstone, Arthur G., 4,153,278, Cl. 285-18.000.
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Vetter, Heinz; and Friedrich, Ernst, to Rohm GmbH. Methods for bending stretched synthetic resin sheets. 4,153,663, Cl. 264-286.000.

Veutgen, Hans-Jurgen: *See—*
Beyer, Horst; Neuhauser, Hans J.; and Veutgen, Hans-Jurgen, 4,153,477, Cl. 148-1.000.

Vial, Jean: *See—*
Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,153,442, Cl. 71-88.000.

Vienot, Claude: *See—*
Pigeon, Michel; and Vienot, Claude, 4,153,875, Cl. 324-220.000.

Vilaprinyo Oliva, Enrique. Process for obtaining brightly metallized surfaces. 4,153,494, Cl. 156-230.000.

Vilkomerson, David H. R.: *See—*
Alphonse, Gerard A.; Vilkomerson, David H. R.; and Hurley, Bernard, 4,153,894, Cl. 340-1.00R.

Villain, Jacques: *See—*
Grauleau, Didier; Mourier, Jean; Shroff, Arvind; and Villain, Jacques, 4,153,041, Cl. 126-271.000.

Vinals, Joaquin: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
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Virtis Company, Inc., The: *See—*
Adams, Robert P., 4,153,374, Cl. 366-208.000.

Vitzthum, Otto: *See—*
Roselius, Wilhelm; Vitzthum, Otto; and Hubert, Peter, 4,153,063, Cl. 131-143.000.

Vock, Manfred H.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,153,568, Cl. 252-108.000.
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Vockenhuber, Karl: *See—*
Stockl, Friedrich, 4,153,351, Cl. 352-91.00C.

Vohringer, Karl: *See—*
Zerhoch, Horst; and Vohringer, Karl, 4,152,913, Cl. 72-20.000.

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Mamon, Glenn; Youmans, Douglas G.; and Volp, Jeffrey A., 4,153,366, Cl. 356-5.000.

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von der Heide, Jack; Edelman, Robert J.; and McLeod, Murray R., to American Micro-Bionics Corp. Apparatus for use in artificial kidney system. 4,153,554, Cl. 210-96.00M.

Vonick, Frederick. Lighting control apparatus. 4,153,860, Cl. 315-155.000.

von Schlichtegroll, Ansgar: *See—*
Kleemann, Axel; Klingler, Karl H.; von Schlichtegroll, Ansgar; Stroman, Fritz; Thiemer, Klaus; and Westermann, Erik, 4,153,696, Cl. 424-253.000.

Vorbach, Emil, to Mannesmann Aktiengesellschaft. Hot rolling pilger mill. 4,152,917, Cl. 72-189.000.

Vyshinsky, Nikolai V.: *See—*
Tyavlovsky, Mikhail D.; Kundas, Semen P.; Los, Mechislav N.; Serenkov, Valentin J.; and Vyshinsky, Nikolai V., 4,152,914, Cl. 72-38.000.

Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See—*
Kakac, Karel; Slezak, Adolf; and Janda, Jaroslav, 4,153,226, Cl. 248-20.000.

W. R. Grace & Co.: *See—*
Guithues, William L.; and Legal, Casimer C., Jr., 4,153,441, Cl. 71-34.000.
Rosenberg, Arnold M.; and Gaidis, James M., 4,153,473, Cl. 134-5.000.
Seybert, Earl K., 4,153,680, Cl. 424-49.000.

Waage, Harold M. Keyboard controlled just intonation computer. 4,152,964, Cl. 84-1.010.

Waagner-Biro Aktiengesellschaft: *See—*
Kemmetmueller, Roland, 4,152,843, Cl. 34-229.000.

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Huth, Andreas; Schmiechen, Ralph; Kehr, Wolfgang; Palenschat, Dieter; Paschelke, Gert; and Wachtel, Helmut, 4,153,713, Cl. 424-274.000.

Wagner Electric Corporation: *See—*
Falk, Edward J., 4,152,897, Cl. 60-562.000.

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Gericke, Rolf; Rogalski, Werner; Bergmann, Rolf; Hameister, Walter; and Wahlig, Helmut, 4,153,693, Cl. 424-246.000.

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Walberg, Maynard E., to Allis-Chalmers Corporation. Ladder hinge and stabilizer therefor. 4,153,138, Cl. 182-98.000.

Walker, Peter F.: *See—*
Hall, Patrick; and Walker, Peter F., 4,152,970, Cl. 91-318.000.

Walker, Wellington E.: *See—*
Kaplan, Leonard; Walker, Wellington E.; and O'Connor, George L., 4,153,623, Cl. 260-449.00L.

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Walters, Eugene G.; and Ruck, Heinz E., to Fibre-Metal Products Company, The. Adjustable eyeglass temple. 4,153,348, Cl. 351-118.000.

Walton, Charles E., II, to Burroughs Corporation. Tool for removing integrated circuit packages. 4,152,827, Cl. 29-764.000.

Walworth, Vivian K.: *See—*
Gerber, Arthur M.; and Walworth, Vivian K., 4,153,462, Cl. 96-94.00R.

Wang, Samuel S.; and Lewellyn, Morris E., to American Cyanamid Company. Sodium dialkyl sulfosuccinates as dewatering aids in the filtration of mineral concentrates. 4,153,549, Cl. 210-54.000.

Wang, Shyh, to University of California, The Regents of the. Polarization converter and circuit elements for use in optical waveguides. 4,153,328, Cl. 350-96.110.

Ward, Derrick A.: *See—*
Warner, Arthur R.; and Ward, Derrick A., 4,153,861, Cl. 315-355.000.

Ward, Gary A.; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Cap closure and method of producing same. 4,153,173, Cl. 215-232.000.

Warner, Arthur R.; and Ward, Derrick A. Electric discharge tube apparatus. 4,153,861, Cl. 315-355.000.

Warner, C. James: *See—*
Holmes, Dale E.; Konkle, Donald W.; Warner, C. James; and Hansen, Richard L., 4,153,248, Cl. 273-58.00A.

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Zinnes, Harold; and Lindo, Neil A., 4,153,711, Cl. 424-273.00P.

Warolin, Christian J. M.; Muller, Pierre; and Zaoui, Roger, to Recherches Pharmaceutiques et Scientifiques. Therapeutically useful cysteinol and homocysteinol derivatives. 4,153,729, Cl. 424-325.000.

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Watanabe, Shuji: *See—*
Emi, Toshihiko; Haida, Osamu; Okano, Shinobu; Watanabe, Shuji; Fujiwara, Akitoshi; Shiraishi, Toshiaki; Ooi, Hiroshi; Iwasaki, Toshio; and Okamoto, Noboru, 4,153,454, Cl. 75-124.000.

Waters Associates, Inc.: *See—*
McNeil, Roderick J.; and Hutchins, Burleigh M., 4,153,076, Cl. 137-624.110.

Watterback, Paul G., to AB Sibe International. Detector for liquid media. 4,153,846, Cl. 307-118.000.
Watts, Leonard, to Technicon Instruments Corporation. Strain reduction or reversal technique for continuous casting of metals. 4,153,098, Cl. 164-83.000.
Wearmouth, William R.: *See—*
Hart, Anthony C.; and Wearmouth, William R., 4,153,453, Cl. 75-123.00J.
Weavers, Mark W., to Minnesota Mining and Manufacturing Company. Double-acting latch for hinged plastic box. 4,153,178, Cl. 220-306.000.
Weber, Brigitte: *See—*
Lauterberg, Werner; Steinmetzer, Herbert; Weber, Brigitte; Haack, Dieter; and Taube, Werner, 4,153,762, Cl. 521-53.000.
Weber, Eugen, to Orbisphere Corporation; and Succursale de Collonge Bellerive. Adjusting knob device for electrical instruments and the like. 4,153,149, Cl. 192-95.000.
Weber, Richard: *See—*
Jungfer, Leopold, deceased; Jungfer, Helmut, heir; Meyenburg, Ingeborg, heir; Kautschitsch, Dieter; and Weber, Richard, 4,153,867, Cl. 320-43.000.
Webster, Charles W.: *See—*
Green, Wendel C.; Cunningham, Russell E.; Light, Gordon S.; Sharkitt, Patrick J.; and Webster, Charles W., 4,153,931, Cl. 364-200.000.
Webster, George, to Metal Box Limited. Closing of containers. 4,152,997, Cl. 113-24.00R.
Webster, William C.: *See—*
Minnick, Leonard J.; Webster, William C.; and Smith, Charles L., 4,153,655, Cl. 264-8.000.
Weigand, Donald E., to Conwed Corporation. Manufacture of fibrous web structures. 4,153,488, Cl. 156-62.200.
Weiland, Carl W. Solid fuel internal combustion engine. 4,152,890, Cl. 60-39.030.
Weiland, Emil, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung. Helicopter rotor structure. 4,153,390, Cl. 416-138.000.
Weiler, Wolfgang, to MTU Munchen GmbH. Cover arrangement for radial rotors of turbo machines such as gas turbine engines. 4,153,387, Cl. 415-219.00C.
Weimann, Norbert: *See—*
Winkelmann, Hans D.; Wolf, Karlheinz; Oertel, Harald; and Weimann, Norbert, 4,153,775, Cl. 528-45.000.
Weisbrod, James G.; and Eby, John C., Jr., to Recognition Equipment Incorporated. Mark sense reader. 4,153,895, Cl. 340-146.3AG.
Weisler, Morris J.: *See—*
Rodosta, John; and Weisler, Morris J., 4,152,795, Cl. 5-62.000.
Weissman, Richard; Haack, Christian H.; and Fried, Michael W. Water trough attachment for a horse trailer. 4,153,011, Cl. 119-72.000.
Welborn, Ronald D., to Didde-Glaser, Incorporated. Hold-down clamp assembly for upper swingable inker of perfecting press. 4,152,985, Cl. 101-352.000.
Weller, Robert A.; and Davis, Russ E., to United States of America, Navy. Vector measuring current meter. 4,152,934, Cl. 73-189.000.
Wells, Peter M., Jr., to Ideal Industries Incorporated. Precision small wire and untwisting tool. 4,152,797, Cl. 7-129.000.
Wenban, James R.: *See—*
Silver, Alexander; and Wenban, James R., 4,153,315, Cl. 308-9.000.
Wendt, Robert F.: *See—*
Acker, Jan R.; Braton, Norman R.; Koutsky, James A.; and Wendt, Robert F., 4,153,555, Cl. 210-198.00R.
Wermuth, Camille G.: *See—*
Dimicoli, Jean-Luc; Wermuth, Camille G.; and Bieth, Joseph G., 4,153,688, Cl. 424-177.000.
Werner, Erik S. E.: *See—*
Verloop, Jan; Goetzee, Rudolf C.; and Werner, Erik S. E., 4,153,674, Cl. 423-573.000.
Wertepny, Joseph R. Traverse-rod construction for automatically providing even folding and unfolding or drapery supported thereby. 4,152,809, Cl. 16-96.00D.
Werz, Jakob F.; and Munk, Edmund E., to Werzalit, J. F. Werz Jr. KG Pressholzwerk. Method of manufacturing coated composite articles from a non-flowable mixture, and articles obtained thereby. 4,153,490, Cl. 156-85.000.
Werzalit, J. F. Werz Jr. KG Pressholzwerk: *See—*
Werz, Jakob F.; and Munk, Edmund E., 4,153,490, Cl. 156-85.000.
Westelaken, Christianus M. T. Flow control meters for gravity flow particle dryers. 4,152,841, Cl. 34-167.000.
Westermann, Erik: *See—*
Kleemann, Axel; Klingler, Karl H.; von Schlichtegroll, Ansgar; Stroman, Fritz; Thiemer, Klaus; and Westermann, Erik, 4,153,696, Cl. 424-253.000.
Western Gear Corporation: *See—*
Hawley, Royal T., 4,153,381, Cl. 405-173.000.
Western Irrigation and Manufacturing, Inc.: *See—*
Marcotte, Dennis, 4,153,070, Cl. 137-344.000.
Westinghouse Electric Corp.: *See—*
Cross, Michael A., 4,153,331, Cl. 350-96.200.
Loving, Roderick L.; and Hine, Louis P., Jr., 4,153,310, Cl. 312-100.000.
Rampolla, Robert W.; and Van Hook, Brewton O., 4,153,224, Cl. 244-3.160.
Sherwood, Edward F.; and Markle, Larry M., 4,153,234, Cl. 256-69.000.
Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,153,740, Cl. 427-8.000.
Taylor, John W., Jr., 4,153,899, Cl. 343-7.700.
Todt, William H.; and Playfoot, Kerwin C., 4,152,937, Cl. 73-290.00R.
Wheeler, Edward L.; and Jancis, Elmar H., to Uniroyal, Inc. Hindered phenolic nitro compounds as antioxidants. 4,153,597, Cl. 260-45.85B.
White, David B.; Pacitti, William; and Gensler, Edwin G., to La-Z-Boy Chair Company. Recliner chair. 4,153,292, Cl. 297-83.000.
White, John T.; and Lovelady, Kenneth T., to Recognition Equipment Incorporated. Variable frequency multi-orifice IJP. 4,153,901, Cl. 346-75.000.
White, Roy L., to Xenotron Limited. Compression and expansion of symbols. 4,153,896, Cl. 340-731.000.
White, Thomas P., Sr. Road hockey puck. 4,153,253, Cl. 273-128.00R.
Whitten, Charles E.: *See—*
Bader, Henry; and Whitten, Charles E., 4,153,631, Cl. 260-590.00C.
Wichterle, Otto, to NPD Technologies, Inc. Soft contact lens with thin edge. 4,153,349, Cl. 351-160.00H.
Wide, Leif E.: *See—*
Hallgren, Henning R.; and Wide, Leif E., 4,153,417, Cl. 23-230.00B.
Widmer, Raoul Imseng and Urs, as agents for Allemeine Treuhand AG, Zurich, Switzerland, legal representatives: *See—*
Buttner, Franz, deceased, 4,153,271, Cl. 280-615.000.
Wieder, Horst K. Double chamber ionization smoke detector. 4,153,840, Cl. 250-381.000.
Wieschen, Hermann: *See—*
Gerken, Rudolf; Guth, Hans; Mucke, Christoph; Potes, Willi; and Wieschen, Hermann, 4,153,628, Cl. 423-531.000.
Wilcox, Raymond J. Method for making a vehicle wheel with a foamed resin core. 4,153,657, Cl. 264-46.600.
Wild, Hans: *See—*
Fink, Peter; Wild, Hans; Zizlsperger, Johann; Reffert, Rudi W.; and Thielen, Gunter, 4,153,501, Cl. 159-49.000.
Wildi, Theodore; and Huard, Bertrand, to Lab-Volt Limited. Electrical connector post. 4,153,323, Cl. 339-95.00R.
Wilkesmann, Helmut: *See—*
Hultsch, Gunther; and Wilkesmann, Helmut, 4,153,551, Cl. 210-78.000.
Wilkinson Sword Limited: *See—*
Rowsell, David G.; Spring, David J.; and Hems, Roger, 4,153,679, Cl. 424-45.000.
William H. Rorer, Inc.: *See—*
Campbell, Henry F.; Santora, Norman J.; and Douglas, George H., 4,153,722, Cl. 424-304.000.
Williams, Charles E., to Grow Chemical Corp. Rubber compositions comprising dibromopolybutadiene and a solid polyamide. 4,153,642, Cl. 260-837.00R.
Willis, William M., to Willis, Wm. M. & Isabel; Adams, John W. & Dolores C.; Bradbury, Edward T. & Charlotte L.; Lefevre, Robert A. & Dorthy J.; Seeley, Carl L. & Colene; and Contreras, Gilbert & Dolores D. Filter condition indicator. 4,153,003, Cl. 116-268.000.
Willis, Wm. M. & Isabel: *See—*
Willis, William M., 4,153,003, Cl. 116-268.000.
Wilson, Floyd, Jr. Insulated glass and sealant therefore. 4,153,594, Cl. 260-31.80R.
Wilson, Jerry F.: *See—*
Graser, Earl J.; and Wilson, Jerry F., 4,153,158, Cl. 206-173.000.
Wilson, Thomas A.; and Baxter, Hallie W. Cycle stabilizing accessory. 4,153,268, Cl. 280-296.000.
Wilson Trailer Company: *See—*
Lewis, Mack A.; and Greive, Don A., 4,153,289, Cl. 296-24.00C.
Winchell, David A.: *See—*
Ward, Gary A.; and Winchell, David A., 4,153,173, Cl. 215-232.000.
Winkelmann, Hans D.; Wolf, Karlheinz; Oertel, Harald; and Weimann, Norbert, to Bayer Aktiengesellschaft. Self-crosslinkable polyurethanes. 4,153,775, Cl. 528-45.000.
Winnacker, Helmut; and Dierssen, Jurgen, to Preussag Aktiengesellschaft. Underwater camera. 4,153,357, Cl. 354-64.000.
Wintrell, Reginald, to Arthur G. McKee & Company. Synthetic gas production. 4,153,426, Cl. 48-73.000.
Wirt, Leslie S., to Lockheed Corporation. Wave powered motor. 4,152,895, Cl. 60-398.000.
Wisniewski, Edward F.: *See—*
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,153,738, Cl. 426-656.000.
Wisotsky, Max J., to Exxon Research & Engineering Co. Polymer combinations useful in distillate hydrocarbon oils to improve cold flow properties. 4,153,422, Cl. 44-62.000.
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Witt, Frank A. Flight training method and apparatus. 4,152,846, Cl. 35-12.00B.
Witte, Ernst-Christian: *See—*
Wolff, Hans P.; Witte, Ernst-Christian; Thiel, Max; Stork, Harald; and Roesch, Egon, 4,153,728, Cl. 424-319.000.
Wittenberg, Roland C.; Alexandrovich, George; and Frielingsdorf, Frank J., to Pickering & Company, Inc. Record stamper playback turntable. 4,153,257, Cl. 274-39.00R.
Woelffer, Neill C.: *See—*
Gandrud, Merlin H.; and Woelffer, Neill C., 4,152,884, Cl. 56-202.000.

Wojcikowski, Czeslaw: *See*—
Brzozowski, Zdzislaw; Magielka, Stanislaw; Angielski, Stefan; Janicki, Stanislaw; Wojcikowski, Czeslaw; and Jakubowski, Zenon, 4,153,710, Cl. 424-273.00P.

Wolf, Karlheinz: *See*—
Winkelmann, Hans D.; Wolf, Karlheinz; Oertel, Harald; and Weimann, Norbert, 4,153,775, Cl. 528-45.000.

Wolfe, Robert W., to GTE Sylvania Incorporated. Ultraviolet emitting CeYMg aluminate fluorescent lamp phosphor for psoriasis treatment. 4,153,572, Cl. 252-301.40R.

Wolff, Hans P.; Witte, Ernst-Christian; Thiel, Max; Stork, Harald; and Roesch, Egon, to Boehringer Mannheim GmbH. Phenoxyalkylcarboxylic acid compounds and therapeutic compositions. 4,153,728, Cl. 424-319.000.

Wong, Henry: *See*—
Monkovic, Ivo; Bachand, Carol; and Wong, Henry, 4,153,603, Cl. 546-142.000.

Wong, Man-Chong: *See*—
Dykeman, Robert H.; and Wong, Man-Chong, 4,153,528, Cl. 204-192.00R.

Woodhouse, Charles F., to Approach Fish. Wind monitoring assembly and method. 4,152,933, Cl. 73-189.000.

Woodman, Trevor P.; and Fischer, Albert, to Woodman, Trevor P.; and Fischer, Albert. Spectrally selective surfaces and method of fabricating the same. 4,153,753, Cl. 428-409.000.

Woods, Daniel J.: *See*—
Spisz, Albert S.; and Woods, Daniel J., 4,153,142, Cl. 188-75.000.

Woodson, Leland B. Putter training device. 4,153,255, Cl. 273-186.00A.

Wrede, Wilhelm: *See*—
Guinomet, Yves; Tenhaven, Ulrich; Wrede, Wilhelm; Schoenemann, Rudolf; Friedemann, Wolfgang; Groschopp, Heinz; and Germscheid, Hans G., 4,152,916, Cl. 72-42.000.

Wright, Andrew C. W., to Dzus Fastener Co. Inc. Pawl latch. 4,153,284, Cl. 292-202.000.

Wright Line Inc.: *See*—
Bellanca, Gary J., 4,153,277, Cl. 282-9.00R.

Wu, Ching-Yong; Swift, Harold E.; and Bozik, John E., to Gulf Research & Development Company. Preparation of cumene hydroperoxide. 4,153,635, Cl. 568-574.000.

Wu, Chisung: *See*—
Karol, Frederick J.; Wu, Chisung; Reichle, Walter T.; and Maraschin, Norma J., 4,153,576, Cl. 252-428.000.

Wunsch, Gerd: *See*—
Boehn, Hugo; Treptow, Wolfram; Wunsch, Gerd; Kiener, Volker; Meyer, Hermann; and Csizi, Gotthard, 4,153,742, Cl. 427-126.000.

Wylain, Inc.: *See*—
Deters, Elmer M., 4,153,073, Cl. 137-493.400.

Xenotron Limited: *See*—
White, Roy L., 4,153,896, Cl. 340-731.000.

Xerox Corporation: *See*—
Batchelor, Philip J.; and Legg, Ernest L., 4,153,241, Cl. 271-4.000.
Turner, Sam R., 4,153,802, Cl. 560-21.000.

Yabe, Yuhiko: *See*—
Azuma, Nobuo; Abe, Yuuhei; Mohri, Katsuo; and Yabe, Yuhiko, 4,153,922, Cl. 361-3.000.

Yamabe, Masaaki; Munekata, Seiji; and Samejima, Shunichi, to Asahi Glass Co. Ltd. Process for producing fluorinated vinyl ether having ester group. 4,153,804, Cl. 560-183.000.

Yamada, Hirosi: *See*—
Narita, Yoshihiro; Konuma, Hideo; Tagami, Sanae; and Yamada, Hirosi, 4,153,780, Cl. 528-198.000.

Yamada, Kimio: *See*—
Iio, Katsuro; Takenouchi, Naoki; and Yamada, Kimio, 4,153,832, Cl. 219-124.340.

Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Information setting apparatus for cameras. 4,153,358, Cl. 354-106.000.

Yamamoto, Hideo: *See*—
Okada, Katsuto; Yamamoto, Hideo; Teraguchi, Susumu; and Ishibashi, Norio, 4,153,544, Cl. 210-12.000.

Yamamoto, Mamoru: *See*—
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Tsuruta, Hideki; Yamamoto, Mamoru; and Kato, Kenichi, 4,153,630, Cl. 260-578.000.

Yamamoto, Minoru: *See*—
Shinoda, Masaichi; Nakamura, Tetsuo; and Yamamoto, Minoru, 4,153,906, Cl. 357-23.000.

Yamamoto, Toshiyuki: *See*—
Hamazaki, Yasuhiko; Yamamoto, Toshiyuki; Kawabata, Shozo; Seri, Kenji; Sakasai, Masao; Sato, Reiko; and Ishiyama, Nobuo, 4,153,724, Cl. 424-308.000.

Yamanaka, Yoshiyuki: *See*—
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Tsuruta, Hideki; Yamamoto, Mamoru; and Kato, Kenichi, 4,153,630, Cl. 260-578.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Matsui, Hidefumi; Tomioka, Kenichi; Kawada, Hiroitsu; and Maeno, Hiroo, 4,153,727, Cl. 414-317.000.
Shiba, Kikuo, 4,153,681, Cl. 424-72.000.

Yamao, Junzo: *See*—
Murata, Kazuo; Tanso, Shiro; and Yamao, Junzo, 4,153,759, Cl. 429-147.000.

Yamashita, Norio: *See*—
Ikeguchi, Shigehiko; and Yamashita, Norio, 4,153,884, Cl. 331-1.00A.

Yamashita, Toshio: *See*—
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,153,484, Cl. 148-32.000.

Yamazaki, Masami; and Ando, Masahisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Composite valve. 4,153,078, Cl. 137-882.000.

Yang, Lien C., to United States of America, National Aeronautics and Space Administration. Underwater seismic source. 4,153,134, Cl. 181-120.000.

Yano, Hirofumi; Okamura, Noriaki; and Toyoda, Tsunehiko, to Dai Nippon Toryo Co., Ltd. Method of ink jet printing. 4,153,467, Cl. 106-20.000.

Yano, Kozo: *See*—
Hamada, Hiroshi; Nakauchi, Hiroshi; Hishida, Tadanori; and Yano, Kozo, 4,153,344, Cl. 350-357.000.

Yano, Tetsuo: *See*—
Iguchi, Shigeru; Iwata, Tamotu; and Yano, Tetsuo, 4,153,458, Cl. 96-67.000.

Yashiro, Kuniji: *See*—
Ayano, Yukihiko; Yashiro, Kuniji; and Niizuma, Akira, 4,153,479, Cl. 148-6.15Z.

Yasuda, Michio; Nakano, Yasuaki; Fujisawa, Hiromichi; and Hananoi, Toshihiro, to Hitachi, Ltd. Method and device for detecting the similarity between standard and unknown patterns. 4,153,897, Cl. 340-146.30Q.

Yasuda, Yoshinobu: *See*—
Kimata, Kei; Nakazeki, Tsugito; and Yasuda, Yoshinobu, 4,153,018, Cl. 123-103.00R.

Yen, Leslie: *See*—
Novak, Leslie M.; and Yen, Leslie, 4,153,900, Cl. 343-17.2PC.

Yonan, Peter K.: *See*—
Renbarger, Jerry J.; and Yonan, Peter K., 4,153,797, Cl. 546-237.000.

Yonekura, Mikio: *See*—
Abe, Haruhisa; and Yonekura, Mikio, 4,152,978, Cl. 100-35.000.

Yonemitsu, Eiichi: *See*—
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, 4,153,644, Cl. 260-876.00B.

Yoshida, Akitoshi; Kosaka, Masaharu; and Inoue, Shigeki, to Kikusui Kagaku Kogyo Kabushiki Kaisha. Coating composition for thick coating. 4,153,591, Cl. 260-29.60S.

Yoshida, Takeshi, to Hokushin Electric Works, Ltd. Pneumatic controller. 4,153,068, Cl. 137-84.000.

Yoshimoto, Koichi. Ball skate. 4,153,263, Cl. 280-11.1BR.

Yoshioka, Hiroshi: *See*—
Sakata, Mamoru; Yoshioka, Hiroshi; and Ohashi, Masahiro, 4,153,131, Cl. 180-43.00R.

Youmans, Douglas G.: *See*—
Mamon, Glenn; Youmans, Douglas G.; and Volp, Jeffrey A., 4,153,366, Cl. 356-5.000.

Young, Carter R.: *See*—
Pounds, Steve R.; Young, Carter R.; and Trahan, Richard J., 4,153,108, Cl. 166-118.000.

Young, Richard A.; and Stanek, Mark J., to Sigmaform Corporation. Wrap around heat shrinkable closure. 4,153,747, Cl. 428-40.000.

Young, Wayne S.: *See*—
Swiss, William R.; and Young, Wayne S., 4,153,491, Cl. 156-89.000.

Yuasa Battery Company Limited: *See*—
Murata, Kazuo; Tanso, Shiro; and Yamao, Junzo, 4,153,759, Cl. 429-147.000.

Yui, Hiroshi, to Mitsubishi Petrochemical Co., Ltd. High inorganic filler content composition. 4,153,587, Cl. 260-23.00H.

Zabel, Wolf: *See*—
Bender, Hans; Zabel, Wolf; Duren, Gottfried; and Unkelbach, Karl-Heinz, 4,153,542, Cl. 209-223.00R.

Zabiak, Daniel M.; and Hwang, Ki-Sup, to A. B. Dick Company. Fluorescent ink composition for jet printing. 4,153,593, Cl. 260-29.6ME.

Zacher, Wieland: *See*—
Boettcher, Klaus; Hoerdt, Heinrich G.; Zacher, Wieland; and Buechner, Oskar, 4,153,774, Cl. 526-352.200.

Zaoui, Roger: *See*—
Warolin, Christian J. M.; Muller, Pierre; and Zaoui, Roger, 4,153,729, Cl. 424-325.000.

Zellweger, Ltd.: *See*—
Mannhart, Werner, 4,152,931, Cl. 73-160.000.

Zellweger Uster Ltd.: *See*—
Altenweger, Alois, 4,152,815, Cl. 28-198.000.

Zenith Radio Corporation: *See*—
Delsing, Dale; and Fogelson, Mark, 4,153,857, Cl. 313-481.000.

Zerhoch, Horst; and Vohringer, Karl, to Horst Zerhoch Vorrichtungs und maschinenbau GmbH & Co. KG. Straightening machine for straightening sheet metal and flat materials. 4,152,913, Cl. 72-20.000.

Zielinski, James: *See*—
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., 4,153,566, Cl. 252-51.50A.

Zimmerman, John A., Jr.: *See*—
Frantz, Robert H.; and Zimmerman, John A., Jr., 4,153,326, Cl. 339-99.00R.

Zimmerman, Robert R.: *See*—
Holmes, Robert E.; and Zimmerman, Robert R., 4,153,518, Cl. 204-38.00B.

Zinnato, Armand P.: *See*—
Ver Nooy, Charles D., III; and Zinnato, Armand P., 4,153,414, Cl. 8-41.00R.

Zinnes, Harold; and Lindo, Neil A., to Warner-Lambert Company. 3-(3H-Pyrazol-3-one)-2-(disubstituted aminomethyl)indoles and pharmaceutical preparations. 4,153,711, Cl. 424-273.00P.

Zizlsperger, Johann: *See*—
Fink, Peter; Wild, Hans; Zizlsperger, Johann; Reffert, Rudi W.; and Thielen, Gunter, 4,153,501, Cl. 159-49.000.

Zullo, Leonard F.: *See*—
Tauber, Carl F., Jr., 4,153,244, Cl. 272-117.000.

Zunker, Reinhard: *See*—
Schiessler, Siegfried; Spietschka, Ernst; and Zunker, Reinhard, 4,153,602, Cl. 546-37.000.

Zuvela, Bernard R.; and Teys, Raymond W., to Scientific Drilling Controls. Change in length of drill string while instrument remains therein. 4,153,120, Cl. 175-57.000.

Zwack, Robert R.; and Christenson, Roger M., to PPG Industries, Inc. Method for cleaning membrane filter. 4,153,545, Cl. 210-23.00F.

ZYMA S.A.: *See*—
Courbat, Pierre; and Albert, Alban, 4,153,788, Cl. 536-8.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MAY, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. F. Stoddard & Co., Ltd.: *See—*
Hospied, Jean J., Re. 29,988, Cl. 156-72.000.

Allied Chemical Corporation: *See—*
Polk, Donald E.; and Morris, Robert C., Re. 29,989, Cl. 428-661.000.

Analog Devices, Incorporated: *See—*
Wold, Ivar, Re. 29,992, Cl. 340-347.0NT.

Booth, Ralph: *See—*
Brownhill, Edward J.; Heaton, Roy; and Booth, Ralph, Re. 29,985, Cl. 192-41.00A.

Brownhill, Edward J.; Heaton, Roy; and Booth, Ralph, to Renold Limited. Sprag clutches. Re. 29,985, Cl. 192-41.00A.

Clayton Manufacturing Company: *See—*
Howes, Peter A., Re. 29,984, Cl. 73-117.300.

Crandall, Clyde O.; and Douglas, Charles, to Safeway Stores, Incorporated. Apparatus and method for washing interiors of truck and trailer bodies. Re. 29,987, Cl. 134-8.000.

Davies, Terrence A.; and Pedder, David J., to Square D Company. Electrical contact material and process. Re. 29,986, Cl. 75-234.000.

Douglas, Charles: *See—*
Crandall, Clyde O.; and Douglas, Charles, Re. 29,987, Cl. 134-8.000.

Heather, James B.: *See—*
Sih, Charles J.; and Heather, James B., Re. 29,990, Cl. 560-121.000.

Heaton, Roy: *See—*
Brownhill, Edward J.; Heaton, Roy; and Booth, Ralph, Re. 29,985, Cl. 192-41.00A.

Hospied, Jean J., to A. F. Stoddard & Co., Ltd. Process and device for making fabrics with non-woven pile. Re. 29,988, Cl. 156-72.000.

Howes, Peter A., to Clayton Manufacturing Company. Engine ignition and power analyzer. Re. 29,984, Cl. 73-117.300.

Martin Marietta Corporation: *See—*
Wolcott, John R., Re. 29,991, Cl. 179-15.0AP.

Morris, Robert C.: *See—*
Polk, Donald E.; and Morris, Robert C., Re. 29,989, Cl. 428-661.000.

Pedder, David J.: *See—*
Davies, Terrence A.; and Pedder, David J., Re. 29,986, Cl. 75-234.000.

Polk, Donald E.; and Morris, Robert C., to Allied Chemical Corporation. Cutting blades made of or coated with an amorphous metal. Re. 29,989, Cl. 428-661.000.

Renold Limited: *See—*
Brownhill, Edward J.; Heaton, Roy; and Booth, Ralph, Re. 29,985, Cl. 192-41.00A.

Safeway Stores, Incorporated: *See—*
Crandall, Clyde O.; and Douglas, Charles, Re. 29,987, Cl. 134-8.000.

Sih, Charles J.; and Heather, James B., to Wisconsin Alumni Research Foundation. Processes for stereospecifically preparing chiral 2-substituted-4-hydroxy-2-cyclopenten-1-one. Re. 29,990, Cl. 560-121.000.

Square D Company: *See—*
Davies, Terrence A.; and Pedder, David J., Re. 29,986, Cl. 75-234.000.

Wisconsin Alumni Research Foundation: *See—*
Sih, Charles J.; and Heather, James B., Re. 29,990, Cl. 560-121.000.

Wolcott, John R., to Martin Marietta Corporation. Adaptable time division switch. Re. 29,991, Cl. 179-15.0AP.

Wold, Ivar, to Analog Devices, Incorporated. Integrating analog-to-digital converter having digitally-derived offset error compensation and bipolar operation without zero discontinuity. Re. 29,992, Cl. 340-347.0NT.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See—*
Hauser, Stephen G., 251,798, Cl. D24-1.100.
Hauser, Stephen G., 251,799, Cl. D24-1.100.
Hauser, Stephen G., 251,800, Cl. D24-1.100.

Aberizk, Philip G.: *See—*
Edin, Ronald E.; Aberizk, Philip G.; Mathieu, Norman A.; and Petersen, Ruth G., 251,796, Cl. D23-77.000.

Abernathy, Ronald V. Cover for television receiver rear picture controls or the like. 251,785, 5-8-79, Cl. D14-84.000.

Alex, James G. Game board. 251,812, 5-8-79, Cl. D21-36.000.

Alferow, Basilio, to Spiratone, Inc. Slide viewer. 251,788, 5-8-79, Cl. D16-14.000.

Allmand, Thomas R. Spiral staircase. 251,805, 5-8-79, Cl. D25-63.000.

American Standard Inc.: *See—*
Balkany, Ernest; Smallwood, Larry E.; and Goens, Thomas M., 251,804, Cl. D25-60.000.

Andersen, John I.; and Clayton, Eugene L. Stove. 251,797, 5-8-79, Cl. D23-97.000.

Apri, Erik. Side rail for a picture frame. 251,807, 5-8-79, Cl. D25-79.000.

Balkany, Ernest; Smallwood, Larry E.; and Goens, Thomas M., to American Standard Inc. Door frame or similar article. 251,804, 5-8-79, Cl. D25-60.000.

Ball Corporation: *See—*
Stahel, Alwin J., 251,764, Cl. D6-183.000.

Berkline Corporation, The: *See—*
Long, Stapleton, 251,761, Cl. D6-71.000.

Bird & Son, Inc.: *See—*
Patenaude, Clifford J., 251,808, Cl. D25-80.000.

Blackhawk Industries, Inc.: *See—*
Hutton, James B., 251,781, Cl. D13-24.000.

Bowsky, Benjamin, to Emerson Electric Co. Glow plug energizer. 251,780, 5-8-79, Cl. D13-15.000.

Brady, John F., to Felt Products Mfg. Co. Roadway expansion joint sealing retainer extrusion. 251,806, 5-8-79, Cl. D25-74.000.

Buck Stove Marketing, Corporation: *See—*
Buckner, Carrol E., 251,767, Cl. D7-208.000.

Buckner, Carrol E., to Buck Stove Marketing, Corporation. Fireplace screen. 251,767, 5-8-79, Cl. D7-208.000.

Campbell, William B. Combined desk pen set and plaque. 251,791, 5-8-79, Cl. D19-75.000.

Canfield, Winton J. Fence supportable decoration. 251,777, 5-8-79, Cl. D11-160.000.

Christ, Anthony J. Doll house. 251,814, 5-8-79, Cl. D21-114.000.

Clayton, Eugene L.: *See—*
Andersen, John I.; and Clayton, Eugene L., 251,797, Cl. D23-97.000.

Culbertson, Richard, to General Electric Company. Tape recorder and player or similar article. 251,782, 5-8-79, Cl. D14-6.000.

Davis, Thomas L.: *See—*
Pohs, Henry A.; and Davis, Thomas L., 251,759, Cl. D6-20.000.

DeGelder, Jacob, to Leisure Group, The. Sprayer or similar article. 251,793, 5-8-79, Cl. D23-18.000.

Dellinger, Henry P. Cultivating implement. 251,768, 5-8-79, Cl. D8-7.000.

Delorme, Omer. Game board. 251,811, 5-8-79, Cl. D21-20.000.

DiBenedetto, Luigi, to TRW Inc. Transfer terminal. 251,784, 5-8-79, Cl. D14-45.000.

Dobias, John J. Perpendicular end tube gripping pliers. 251,769, 5-8-79, Cl. D8-58.000.

Eastman Kodak Company: *See—*
Olson, Richard J.; Tersteeg, Glenn E.; and Montalto, Michael S., 251,774, Cl. D10-81.000.

Ebbtide Corporation: *See—*
Trabue, Thomas M., Jr., 251,778, Cl. D12-70.000.

Edin, Ronald E.; Aberizk, Philip G.; Mathieu, Norman A.; and Petersen, Ruth G., to GTE Sylvania Incorporated. Electric heater. 251,796, 5-8-79, Cl. D23-77.000.

Emerson Electric Co.: *See—*
Bowsky, Benjamin, 251,780, Cl. D13-15.000.

Ernst, Frederick T.; and Klay, Frank, to Ernst, Frederick T. Dual compartment fuel container for a chain saw or the like. 251,772, 5-8-79, Cl. D9-175.000.

Felt Products Mfg. Co.: *See—*
Brady, John F., 251,806, Cl. D25-74.000.

Fredriksson, Lars, to K A Bergs Smide AB. Ball bearing swivel for a hook assembly. 251,770, 5-8-79, Cl. D8-367.000.

Fritz, Wilbert G. Music sheet. 251,790, 5-8-79, Cl. D19-1.000.

Fuhrer, Heinz-Georg: *See—*
Schmidt, Helmut; and Fuhrer, Heinz-Georg, 251,775, Cl. D10-81.000.

Gardner-Denver Company: *See—*
Pohs, Henry A.; and Davis, Thomas L., 251,759, Cl. D6-20.000.

General Electric Company: *See—*
Culbertson, Richard, 251,782, Cl. D14-6.000.

Goens, Thomas M.: *See—*
Balkany, Ernest; Smallwood, Larry E.; and Goens, Thomas M., 251,804, Cl. D25-60.000.
Gschwandtner, Eric. Building structure or the like. 251,801, 5-8-79, Cl. D25-17.000.
Gschwandtner, Eric. Building structure or the like. 251,802, 5-8-79, Cl. D25-22.000.
GTE Sylvania Incorporated: *See—*
Edin, Ronald E.; Aberizk, Philip G.; Mathieu, Norman A.; and Petersen, Ruth G., 251,796, Cl. D23-77.000.
Hammerschmidt, Edna M.: *See—*
Hammerschmidt, Leo L., 251,766, Cl. D7-70.000.
Hammerschmidt, Leo L., to Hammerschmidt, Edna M., a part interest. Beverage container handle. 251,766, 5-8-79, Cl. D7-70.000.
Harigai, Hiroshi. Hand held hair dryer. 251,809, 5-8-79, Cl. D28-13.000.
Harter Corporation: *See—*
Wolff, Douglas F.; Minick, Harold N.; and Reinhart, Jay J., 251,779, Cl. D13-13.000.
Hauser, Stephen G., to Abbott Laboratories. Differential cell counter instrument module assembly. 251,798, 5-8-79, Cl. D24-1.100.
Hauser, Stephen G., to Abbott Laboratories. Differential cell counter instrument module assembly. 251,799, 5-8-79, Cl. D24-1.100.
Hauser, Stephen G., to Abbott Laboratories. Differential cell counter instrument and cabinet therefor. 251,800, 5-8-79, Cl. D24-1.100.
Hoyt, Earl E., to Van Dyk Research Corporation. Paper sorter for use in conjunction with a copying machine. 251,789, 5-8-79, Cl. D16-32.000.
Huet, Henri, to Societe de Ventilation et d'Electricite Appliquees Velecta. Electric hairdryer. 251,810, 5-8-79, Cl. D28-13.000.
Hutton, James B., to Blackhawk Industries, Inc. Electrical wire connector. 251,781, 5-8-79, Cl. D13-24.000.
Intercollection Development S.A.: *See—*
Vandenbeuck, Andre, 251,760, Cl. D6-71.000.
K A Bergs Smide AB: *See—*
Fredriksson, Lars, 251,770, Cl. D8-367.000.
Kabushikigaisha Omco: *See—*
Okazaki, Tatsuo, 251,765, Cl. D7-62.000.
Klay, Frank: *See—*
Ernst, Frederick T.; and Klay, Frank, 251,772, Cl. D9-175.000.
Labora Mannheim GmbH fur Labortechnik: *See—*
Schmidt, Helmut; and Fuhrer, Heinz-Georg, 251,775, Cl. D10-81.000.
Leisure Group, The: *See—*
DeGelder, Jacob, 251,793, Cl. D23-18.000.
Long, Stapleton, to Berkline Corporation, The. Seat. 251,761, 5-8-79, Cl. D6-71.000.
Looney, Ben D. Lawn sign. 251,815, 5-8-79, Cl. D20-29.000.
Mathieu, Norman A.: *See—*
Edin, Ronald E.; Aberizk, Philip G.; Mathieu, Norman A.; and Petersen, Ruth G., 251,796, Cl. D23-77.000.
McCann, William E. Combined lavatory and faucet fixture. 251,795, 5-8-79, Cl. D23-58.000.
McCrary, David N. Peanut shoe. 251,756, 5-8-79, Cl. D2-308.000.
Minick, Harold N.: *See—*
Wolff, Douglas F.; Minick, Harold N.; and Reinhart, Jay J., 251,779, Cl. D13-13.000.
Montalto, Michael S.: *See—*
Olson, Richard J.; Tersteeg, Glenn E.; and Montalto, Michael S., 251,774, Cl. D10-81.000.
Moody, Clifford L.; and Moody, John M. Copy holder for a typist. 251,792, 5-8-79, Cl. D19-91.000.
Moody, John M.: *See—*
Moody, Clifford L.; and Moody, John M., 251,792, Cl. D19-91.000.
Morabito, Pascal. Digital watch. 251,773, 5-8-79, Cl. D10-38.000.
Nauta, Jelle G. Liquid dispensing vacuum cleaner. 251,787, 5-8-79, Cl. D15-52.000.
Okado, Tetsuo, to Tomy Kogyo Co., Inc. Toy parking garage. 251,813, 5-8-79, Cl. D21-118.000.
Okazaki, Tatsuo, to Kabushikigaisha Omco. Electric beverage maker. 251,765, 5-8-79, Cl. D7-62.000.
Olson, Richard J.; Tersteeg, Glenn E.; and Montalto, Michael S., to Eastman Kodak Company. Chemical analyzer. 251,774, 5-8-79, Cl. D10-81.000.
Orn, Jan E., to Telefonaktiebolaget L M Ericsson. Combined microphone and loudspeaker for a communication radio installation. 251,783, 5-8-79, Cl. D14-12.000.
Patenaude, Clifford J., to Bird & Son, Inc. Shingle. 251,808, 5-8-79, Cl. D25-80.000.
Pelfrey, Raymond H. Football kicking shoe. 251,757, 5-8-79, Cl. D2-311.000.
Penrod, Dwain. Utility belt. 251,758, 5-8-79, Cl. D2-381.000.
Petersen, Ruth G.: *See—*
Edin, Ronald E.; Aberizk, Philip G.; Mathieu, Norman A.; and Petersen, Ruth G., 251,796, Cl. D23-77.000.
Pohs, Henry A.; and Davis, Thomas L., to Gardner-Denver Company. Trade exhibit structure and lighting therefor. 251,759, 5-8-79, Cl. D6-20.000.
Prevost, Jean. Club chair. 251,762, 5-8-79, Cl. D6-71.000.
Reinhart, Jay J.: *See—*
Wolff, Douglas F.; Minick, Harold N.; and Reinhart, Jay J., 251,779, Cl. D13-13.000.
Rosen, Howard K. Ring. 251,776, 5-8-79, Cl. D11-30.000.
Schmidt, Helmut; and Fuhrer, Heinz-Georg, to Labora Mannheim GmbH fur Labortechnik. Filter photometer. 251,775, 5-8-79, Cl. D10-81.000.
Sklaar, Richard L. Shelter. 251,803, 5-8-79, Cl. D25-26.000.
Smallwood, Larry E.: *See—*
Balkany, Ernest; Smallwood, Larry E.; and Goens, Thomas M., 251,804, Cl. D25-60.000.
Smith, Earnest L. Portable faucet. 251,794, 5-8-79, Cl. D23-23.000.
Societe de Ventilation et d'Electricite Appliquees Velecta: *See—*
Huet, Henri, 251,810, Cl. D28-13.000.
Sovey, Sam F. Christmas tree holder. 251,763, 5-8-79, Cl. D6-105.000.
Spiratone, Inc.: *See—*
Alferow, Basilio, 251,788, Cl. D16-14.000.
Stahel, Alwin J., to Ball Corporation. Potted plant stand. 251,764, 5-8-79, Cl. D6-183.000.
Telefonaktiebolaget L M Ericsson: *See—*
Orn, Jan E., 251,783, Cl. D14-12.000.
Tersteeg, Glenn E.: *See—*
Olson, Richard J.; Tersteeg, Glenn E.; and Montalto, Michael S., 251,774, Cl. D10-81.000.
Tomy Kogyo Co., Inc.: *See—*
Okado, Tetsuo, 251,813, Cl. D21-118.000.
Toro Company, The: *See—*
Wildgen, Leo F., 251,786, Cl. D15-12.000.
Trabue, Thomas M., Jr., to Ebbtide Corporation. Fishing boat interior. 251,778, 5-8-79, Cl. D12-70.000.
Tritton Enterprises Ltd.: *See—*
Tritton, Victor R., 251,771, Cl. D8-382.000.
Tritton, Victor R., to Tritton Enterprises Ltd. Shackle for a meter seal. 251,771, 5-8-79, Cl. D8-382.000.
TRW Inc.: *See—*
DiBenedetto, Luigi, 251,784, Cl. D14-45.000.
Van Dyk Research Corporation: *See—*
Hoyt, Earl E., 251,789, Cl. D16-32.000.
Vandenbeuck, Andre, to Intercollection Development S.A. Chair. 251,760, 5-8-79, Cl. D6-71.000.
Wildgen, Leo F., to Toro Company, The. Snow thrower. 251,786, 5-8-79, Cl. D15-12.000.
Wolff, Douglas F.; Minick, Harold N.; and Reinhart, Jay J., to Harter Corporation. Wiring enclosure for desks. 251,779, 5-8-79, Cl. D13-13.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 8, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

74 4,152,782
168 4,152,783
239 4,152,784

CLASS 3

1.7 4,152,785
4,152,786
27 4,152,787

CLASS 4

6 4,152,788
146 4,152,789
149 4,152,790
172 4,152,791
175 4,152,792
325 4,152,793
432 4,152,794

CLASS 5

62 4,152,795
451 4,152,796

CLASS 7

129 4,152,797

CLASS 8

2.5 A 4,153,412
41 C 4,153,413
41 R 4,153,414

CLASS 9

8 R 4,152,798

CLASS 13

12 4,153,812

CLASS 14

16.1 4,152,799

CLASS 15

1.7 4,152,800
4,152,801
4,152,802
104.94 4,152,803
167 R 4,152,804
168 4,152,805
169 4,152,806
246 4,152,807
250.07 4,152,808

CLASS 16

96 D 4,152,809
144 4,152,810
164 4,152,811

CLASS 19

203 4,152,812

CLASS 23

230 A 4,153,416
230 B 4,153,417
230 EP 4,153,415
232 R 4,153,418

CLASS 24

205.11 F 4,152,813
241 PS 4,152,814

CLASS 28

198 4,152,815

CLASS 29

156.8 R 4,152,816
157 R 4,152,817
157.3 C 4,152,818
252 4,152,819
404 4,152,820
421 R 4,152,821
564.5 4,152,822
571 4,152,823
572 4,152,824
623.2 4,152,825
624 4,152,826
764 4,152,827

CLASS 30

89 4,152,828
139 4,152,829
195 4,152,830
231 4,152,831
276 4,152,832
382 4,152,833

CLASS 33

1 SD 4,152,835
87 4,152,836
125 C 4,152,837
342 4,152,838
366 4,152,839

CLASS 34

56 4,152,840
167 4,152,841
196 4,152,842
229 4,152,843
235 4,152,844

CLASS 35

7 R 4,152,845
12 B 4,152,846
19 R 4,152,847
29 B 4,152,848

CLASS 36

120 4,152,849

CLASS 37

97 4,152,850

CLASS 40

10 R 4,152,851
361 4,152,852
451 4,152,853
610 4,152,854

CLASS 42

16 4,152,855
69 B 4,152,856
88 4,152,857
90 4,152,858

CLASS 43

17.2 4,152,859
37 4,152,860
88 4,152,861
121 4,152,862

CLASS 44

23 4,153,419
33 4,153,420
51 4,153,421
62 4,153,422
4,153,423
4,153,424
71 4,153,425

CLASS 46

1 R 4,152,863
6 4,152,864
116 4,152,865
251 4,152,866
259 4,152,867

CLASS 47

1.1 4,152,868
58 4,152,869

CLASS 48

73 4,153,426
86 R 4,153,427

CLASS 49

49 4,152,871
118 4,152,870
214 4,152,872

CLASS 52

1 4,152,873
27 4,152,874
227 4,152,875
455 4,152,876
481 4,152,878
514 4,152,877

CLASS 53

399 4,152,879
553 4,152,880

CLASS 55

26 4,153,428
68 4,153,429
84 4,153,430
85 4,153,431
90 4,153,432
97 4,153,433
163 4,153,434
227 4,153,435
290 4,153,436

CLASS 56

11.3 4,152,881
13.7 4,152,882
13.9 4,152,883
202 4,152,884

CLASS 57

207 4,152,885
208 4,152,886

CLASS 58

19 R 4,152,887
58 4,152,888
90 B 4,152,889

CLASS 60

39.03 4,152,890
205 4,152,891
290 4,152,892
4,152,893
347 4,152,894
398 4,152,895
445 4,152,896
562 4,152,897
641 4,152,898

CLASS 62

4 4,152,899
21 4,153,437
80 4,152,900
112 4,152,901
157 4,152,902
222 4,152,903
476 4,152,904

CLASS 64

1 C 4,152,905
15 B 4,152,906

CLASS 65

2 4,153,438
4,153,439
19 4,153,440

CLASS 68

5 D 4,152,907
9 4,152,908

CLASS 70

34 4,152,909
159 4,152,910
416 4,152,911

CLASS 71

34 4,153,441
88 4,153,442
4,153,443
94 4,153,444
4,153,445
95 4,153,446
111 4,153,447
120 4,153,448

CLASS 72

10 4,152,912
20 4,152,913
38 4,152,914
42 4,152,915
4,152,916
189 4,152,917
238 4,152,918
250 4,152,919
410 4,152,920
441 4,152,921

CLASS 73

3 4,152,922
28 4,152,923
40.5 R 4,152,924
4,152,925
46 4,152,926
60 4,152,927
61 R 4,152,928
117.3 Re.29,984
136 R 4,152,930
160 4,152,931
168 4,152,932
189 4,152,933
4,152,934
194 F 4,152,935
198 4,152,936
290 R 4,152,937
349 4,152,938
425.4 R 4,152,939
581 4,152,929
653 4,152,940
799 4,152,941

CLASS 74

5 R 4,152,942
87 4,152,943
191 4,152,944
4,152,945
193 4,152,946
230.16 4,152,948
230.17 F 4,152,947
331 4,152,949
471 XY 4,152,950
474 4,152,951
517 4,152,952
569 4,152,953
575 4,152,954
602 4,152,955
603 4,152,956
606 R 4,152,957

CLASS 75

11 4,153,449
26 4,153,450
77 4,153,451
101 BE 4,153,452
123 J 4,153,453
124 4,153,454
171 4,153,455
234 Re.29,986

CLASS 82

47 4,152,958

CLASS 83

123 4,152,959
435.2 4,152,960
471.3 4,152,961
482 4,152,962
762 4,152,963

CLASS 84

1.01 4,152,964
1.03 4,152,965
1.24 4,152,966
236 4,152,967

CLASS 85

71 4,152,968

CLASS 89

41 EA 4,152,969

CLASS 91

318 4,152,970
388 4,152,971

CLASS 92

33 4,152,972

CLASS 96

27 H 4,153,457
27 R 4,153,456
67 4,153,458
73 4,153,459
74 4,153,460
75 4,153,461
94 R 4,153,462
114.1 4,153,463

CLASS 98

33 A 4,152,973

CLASS 99

323.8 4,152,974
352 4,152,975
450.1 4,152,976
640 4,152,977

CLASS 100

35 4,152,978
53 4,152,979

CLASS 101

35 4,152,980
93.01 4,152,981
93.22 4,152,982
93.23 4,152,983
292 4,152,984
352 4,152,985
463 4,152,986

CLASS 102

6 4,152,987
28 M 4,152,988

CLASS 104

2 4,152,989
6 4,152,990
7 R 4,152,991
130 4,152,992

CLASS 106

14.25 4,153,465
14.27 4,153,464
15.05 4,153,466
20 4,153,467
31 4,153,468
42 4,153,469
116 4,153,470
281 R 4,153,471
304 4,153,472

CLASS 111

8 4,152,993

CLASS 112

121.12 4,152,994
262.3 4,152,996
318 4,152,995

CLASS 113

24 R 4,152,997
119 4,152,998

CLASS 114

42 4,152,999
222 4,153,000
312 4,153,001

CLASS 115

900 4,153,002

CLASS 116

268 4,153,003

CLASS 118

48 4,153,004
49.1 4,153,005
63 4,153,006
101 4,153,007
634 4,153,008

CLASS 119

29 4,153,009
52 AF 4,153,010
72 4,153,011

CLASS 122

7 R 4,153,012

CLASS 123

32 EA 4,153,013
4,153,014
52 M 4,153,015
90.15 4,153,016
90.51 4,153,017
103 R 4,153,018
117 R 4,153,019
4,153,020
119 EC 4,153,021
4,153,022
4,153,023
124 R 4,153,024
136 4,153,025
139 AQ 4,153,027
139 AW 4,153,026
141 4,153,028
4,153,029
146.5 A 4,153,030
146.5 D 4,153,031
148 E 4,153,032
198 E 4,153,034
198 F 4,153,033

CLASS 126

91 A 4,153,035
121 4,153,036
270 4,153,037
4,153,038
271 4,153,039
4,153,040
4,153,041
4,153,042
4,153,043
299 D 4,153,044
384 4,153,045
390 4,153,046
400 4,153,047

CLASS 128

64 4,153,050
89 R 4,153,051
90 4,153,052
92 E 4,153,053
132 D 4,153,054
156 4,153,055
234 4,153,056
272.1 4,153,057
347 4,153,058
419 D 4,153,049
419 F 4,153,060
420 A 4,153,061
422 4,153,059
476 4,153,062
692 4,153,048

CLASS 131

143 4,153,063
267 4,153,064

CLASS 132

7 4,153,065

CLASS 134

5 4,153,473
8 Re.29,987

CLASS 136

89 PC 4,153,474
4,153,475
4,153,476
4,153,813

CLASS 137

13 4,153,066
15 4,153,067
84 4,153,068
238 4,153,069
344 4,153,070
386 4,153,071
467 4,153,072
493.4 4,153,073
596.12 4,153,074
596.13 4,153,075
624.11 4,153,076
625.17 4,153,077
882 4,153,078

CLASS 138

104 4,153,079
126 4,153,080

CLASS 140

92.7 4,153,081
105 4,153,082

CLASS 141

4 4,153,083
80 4,153,084
311 R 4,153,085

CLASS 144

34 E 4,153,087
34 R 4,153,086
193 A 4,153,088

CLASS 148

1 4,153,477
6.15 R 4,153,478
6.15 Z 4,153,479
6.35 4,153,480
15.5 4,153,481
23 4,153,482
31.5 4,153,483
32 4,153,484
126 4,153,485
175 4,153,486
4,153,487

CLASS 150

7 4,153,089
15 4,153,090
21 4,153,091
33 4,153,092
35 4,153,093

CLASS 152

334 4,153,094
340 4,153,095
415 4,153,096

CLASS 156

62.2 4,153,488
72 Re.29,988
73.3 4,153,489
85 4,153,490
89 4,153,491
172 4,153,492
188 4,153,493
230 4,153,494
384 4,153,495
4,153,496
394 4,153,497
446 4,153,498
494 4,153,499

CLASS 159

6 R 4,153,500
49 4,153,501

CLASS 160

330 4,153,097

CLASS 162

17 4,153,502
123 4,153,503
133 4,153,504
164 R 4,153,505

CLASS 164

83 4,153,098
89 4,153,099
155 4,153,100
428 4,153,101

CLASS 165

8 4,153,102
47 4,153,103
48 S 4,153,104
104 S 4,153,105
174 4,153,106
185 4,153,107

CLASS 166

118 4,153,108
250 4,153,109
262 4,153,110
315 4,153,111
355 4,153,112
356 4,153,113

CLASS 171

65 4,153,114

CLASS 172

59 4,153,115
446 4,153,116
809 4,153,117

CLASS 175

4.51 4,153,118
27 4,153,119
57 4,153,120
96 4,153,121

CLASS 176

20 R 4,153,506

CLASS 177

25 4,153,122
147 4,153,123
210 EM 4,153,124
211 4,153,125
229 4,153,126

CLASS 178

68 4,153,814

CLASS 179

1 A 4,153,820
1 P 4,153,815
15 AP Re.29,991
15 AS 4,153,816
18 BC 4,153,817
27 CA 4,153,818
84 VF 4,153,819
100.4 D 4,153,821
103 4,153,822
189 R 4,153,823

CLASS 180

43 R 4,153,131
65 E 4,153,128
65 R 4,153,127
68 P 4,153,129
70 R 4,153,130
136 4,153,132
154 4,153,133

CLASS 181

120 4,153,134
4,153,135
252 4,153,136

CLASS 182

97 4,153,137
98 4,153,138
155 4,152,834
221 4,153,139

CLASS 184

6 4,153,140
6.2 4,153,141

CLASS 188

75 4,153,142
122 R 4,153,143
266 4,153,144
274 4,153,145

CLASS 190

44 4,153,146

CLASS 192

3.28 4,153,147
41 A Re.29,985
87.17 4,153,148
95 4,153,149

CLASS 194

92 4,153,150

CLASS 195

31 P 4,153,508
51 R 4,153,509
59 4,153,510
99 4,153,511
103.5 K 4,153,512
103.5 R 4,153,513

CLASS 198

456 4,153,151
851 4,153,152

CLASS 200

35 R 4,153,824
44 4,153,826
47 4,153,825
144 B 4,153,827
153 SC 4,153,828
340 4,153,829

CLASS 201

2.5 4,153,514

CLASS 202

241 4,153,515

CLASS 203

64 4,153,516

CLASS 204

1 T 4,153,517
38 B 4,153,518
40 4,153,519
98 4,153,520
105 R 4,153,521
106 4,153,522
129.43 4,153,524
129.6 4,153,523
159.15 4,153,525
159.21 4,153,526
164 4,153,527
192 EC 4,153,529
192 R 4,153,528
252 4,153,530
263 4,153,531
267 4,153,532

CLASS 206

0.5 4,153,153
45.19 4,153,154
150 4,153,155
173 4,153,158
219 4,153,156
225 4,153,157
319 4,153,159
370 4,153,160
386 4,153,161
476 4,153,162
610 4,153,163

CLASS 208

11 R 4,153,533
89 4,153,540
120 4,153,534
4,153,535
4,153,536
177 4,153,537
4,153,538
216 R 4,153,539

CLASS 209

143 4,153,541
223 R 4,153,542
250 4,153,543

CLASS 210

12 4,153,544
23 F 4,153,545
41 4,153,546
48 4,153,547
52 4,153,548
54 4,153,549
66 4,153,550
78 4,153,551
82 4,153,552
95 4,153,553
96 M 4,153,554
198 R 4,153,555
218 4,153,556
222 4,153,559
396 4,153,557
512 R 4,153,558

CLASS 211

41 4,153,164

CLASS 214

138 R 4,153,167

CLASS 215

11 R 4,153,170
12 R 4,153,171
209 4,153,172
232 4,153,173
252 4,153,174
253 4,153,175

CLASS 219

101 4,153,830
121 P 4,153,831
124.34 4,153,832
449 4,153,833

CLASS 220

18 4,153,176
85 R 4,153,177
306 4,153,178

CLASS 221

1 4,153,179

CLASS 222

56 4,153,180
61 4,153,181
95 4,153,182
185 4,153,183
4,153,184
212 4,153,185
378 4,153,186
440 4,153,187

CLASS 224

42.24 4,153,188
45 T 4,153,189

CLASS 226

33 4,153,190
143 4,153,191

CLASS 227

10 4,153,192
156 4,153,193

CLASS 228

29 4,153,194
183 4,153,195

CLASS 229

1.5 B 4,153,196

CLASS 232

5 4,153,197

CLASS 235

303.3 4,153,198

CLASS 236

9 A 4,153,199

CLASS 239

94 4,153,200
102 4,153,201
230 4,153,202
333 4,153,203
428.5 4,153,204
533.9 4,153,205

CLASS 241

14 4,153,206
46.17 4,153,207
82.4 4,153,208
103 4,153,209
282.1 4,153,210

CLASS 242

35.5 A 4,153,211
47 4,153,212
47.01 4,153,213
4,153,214
56 A 4,153,215
56.2 4,153,216
71.8 4,153,217
75.3 4,153,218
84.51 R 4,153,219
4,153,220
86.52 4,153,221
96 4,153,222

CLASS 244

3.1 4,153,223
3.16 4,153,224
118 R 4,153,225

CLASS 248

20 4,153,226
74 PB 4,153,228
240.3 4,153,229
345.1 4,153,230
575 4,153,227

CLASS 249

82 4,153,231
153 4,153,232

CLASS 250

201 4,153,834
214 C 4,153,835
325 4,153,836
343 4,153,837
366 4,153,839
368 4,153,838
381 4,153,840
439 R 4,153,841
445 T 4,153,842
492 A 4,153,843
492 R 4,153,844
517 4,153,845
531 4,153,560

CLASS 251

127 4,153,233

CLASS 252

8.75 4,153,561
46.6 4,153,562
47 4,153,563
51.5 A 4,153,564
4,153,565
4,153,566
4,153,567
108 4,153,568
109 4,153,569
121 4,153,570
156 4,153,571
301.4 R 4,153,572
312 4,153,573
316 4,153,574
352 4,153,575
428 4,153,576
435 4,153,577
438 4,153,578
462 4,153,579
4,153,580
472 4,153,581
511 4,153,582
550 4,153,583

CLASS 256

69 4,153,234

CLASS 260

5 4,153,584
17.4 GC 4,153,585
18 EP 4,153,586
23 H 4,153,587
23.5 A 4,153,588
28.5 B 4,153,589
29.2 EP 4,153,590
29.6 ME 4,153,593
29.6 N 4,153,592
29.6 S 4,153,591
31.8 R 4,153,594
45.7 S 4,153,595
45.8 N 4,153,596
45.85 B 4,153,597
185 4,153,598
207 4,153,599
239 B 4,153,235
239.3 A 4,153,600
306.7 R 4,153,606
306.8 F 4,153,607
316 4,153,608
326.14 R 4,153,609
332.2 C 4,153,610
332.3 P 4,153,611
333 4,153,612
340.9 R 4,153,613
4,153,614
4,153,615
343.5 4,153,616
345.2 4,153,617
4,153,618
346.22 4,153,619
346.73 4,153,620
348.64 4,153,621
397.25 4,153,622
449 L 4,153,623
453 P 4,153,624
457 4,153,625
465 D 4,153,626
505 P 4,153,627
570.8 TC 4,153,629
578 4,153,630
590 C 4,153,631
591 4,153,632
593 R 4,153,633
4,153,634
827 4,153,639
4,153,640
4,153,641
837 R 4,153,642
861 4,153,643
876 B 4,153,644
876 R 4,153,645
878 R 4,153,646
880 R 4,153,647
896 4,153,648
950 4,153,649

CLASS 261

41 D 4,153,650
55 4,153,651
121 B 4,153,652
157 4,153,653

CLASS 264

1 4,153,654
8 4,153,655
40.1 4,153,656
46.6 4,153,657
83 4,153,659
103 4,153,660
120 4,153,661
227 4,153,662
286 4,153,663
289 4,153,664
295 4,153,665
325 4,153,666
532 4,153,667

CLASS 266

252 4,153,236

CLASS 267

64 R 4,153,237

CLASS 269

15 4,153,238
287 4,153,239

CLASS 270

68 R 4,153,240

CLASS 271

4 4,153,241
9 4,153,242

CLASS 272

31 A 4,153,243
117 4,153,244

CLASS 273

1 R 4,153,245
26 A 4,153,246
29 BC 4,153,247
58 A 4,153,248
73 C 4,153,249
86 C 4,153,250
96 D 4,153,251
106 B 4,153,252
128 R 4,153,253
160 4,153,254
186 A 4,153,255

CLASS 274

23 A 4,153,256
39 R 4,153,257

CLASS 277

56 4,153,258
75 4,153,259
181 4,153,260
205 4,153,261

CLASS 280

5 A 4,153,262
11.1 BR 4,153,263
38 4,153,264
112A 4,153,265
276 4,153,266
281 R 4,153,267
296 4,153,268
482 4,153,269
490 R 4,153,270
615 4,153,271
689 4,153,272
740 4,153,273
745 4,153,274

CLASS 281

17 4,153,275
21 R 4,153,276

CLASS 282

9 R 4,153,277

CLASS 285

18 4,153,278
62 4,153,279
97 4,153,280
167 4,153,281
332.3 4,153,282
334 4,153,283

CLASS 292

202 4,153,284

CLASS 294

15 4,153,285
19 R 4,153,286
51 4,153,287

CLASS 296

1 S 4,153,288
24 C 4,153,289
191 4,153,290
193 4,153,291

CLASS 297

83 4,153,292
284 4,153,293
4,153,294
307 4,153,295
367 4,153,296

CLASS 299

2 4,153,297
4,153,298
4,153,299
4,153,300
36 4,153,301

CLASS 301

39 T 4,153,302
63 PW 4,153,303

CLASS 303

81 4,153,305
92 4,153,306
119 4,153,307

CLASS 307

118 4,153,846
243 4,153,847
268 4,153,848
295 4,153,849
354 4,153,850

CLASS 308

9 4,153,315
189 R 4,153,308
217 4,153,309

CLASS 310

23 4,153,851
339 4,153,852

CLASS 312

100 4,153,310
107 4,153,311
198 4,153,312
211 4,153,313
320 4,153,314

CLASS 313

101 4,153,854
105 CM 4,153,855
422 4,153,856
481 4,153,857

CLASS 315

3.5 4,153,859
8 4,153,858
155 4,153,860
355 4,153,861
408 4,153,862

CLASS 316

19 4,153,316
4,153,317

CLASS 318

341 4,153,853
4,153,863
4,153,864
565 4,153,865
696 4,153,866

CLASS 320

43 4,153,867

CLASS 322

48 4,153,868
90 4,153,869

CLASS 323

18 4,153,870
19 4,153,871
21 4,153,872

CLASS 324

60 R 4,153,873
161 4,153,874
220 4,153,875

CLASS 325

15 4,153,876
25 4,153,877
64 4,153,881
370 4,153,878
478 4,153,879

CLASS 328

27 4,153,880

CLASS 330

10 4,153,882
262 4,153,883

CLASS 331

1 A 4,153,884

CLASS 333

28 R 4,153,885
97 S 4,153,888
156 4,153,886
172 4,153,887

CLASS 335

213 4,153,889
260 4,153,890

CLASS 336

70 4,153,891

CLASS 337

159 4,153,892
201 4,153,893

CLASS 339

22 B 4,153,318
75 P 4,153,319
91 B 4,153,320
95 B 4,153,321
95 R 4,153,322
4,153,323
97 R 4,153,324
99 R 4,153,325
4,153,326
205 4,153,327

CLASS 340

1 R 4,153,894
146.3 AG 4,153,895
146.3 Q 4,153,897
347 NT Re.29,992
396 4,153,898
711 4,153,940
731 4,153,896

CLASS 343

7.7 4,153,899
17.2 PC 4,153,900

CLASS 346

75 4,153,901
140 R 4,153,902

CLASS 350

96.11 4,153,328
96.13 4,153,329
96.17 4,153,330
96.20 4,153,331
96.23 4,153,332
96.25 4,153,333
132 4,153,334
150 4,153,335
162 SF 4,153,336
184 4,153,337
4,153,338
4,153,339
252 4,153,340
255 4,153,341
289 4,153,342
349 4,153,343
357 4,153,344
363 4,153,345

CLASS 351

52 4,153,346
90 4,153,347
118 4,153,348
160 H 4,153,349

CLASS 352

78 R 4,153,350
91 C 4,153,351
4,153,352

CLASS 353

114 4,153,353
122 4,153,354

CLASS 354

33 4,153,355
62 4,153,356
64 4,153,357
106 4,153,358
126 4,153,359
195 4,153,903
241 4,153,360
275 4,153,361
293 4,153,362
299 4,153,363

CLASS 355

14 4,153,364
99 4,153,365

CLASS 356

5 4,153,366
225 4,153,368
318 4,153,369
358 4,153,370
400 4,153,367
4,153,371

CLASS 357

13 4,153,904
16 4,153,905
23 4,153,906
30 4,153,907
32 4,153,908
44 4,153,909
68 4,153,910

CLASS 358

10 4,153,911
44 4,153,912
93 4,153,913
195 4,153,914
213 4,153,915
257 4,153,916

CLASS 360

10 4,153,917
55 4,153,920
93 4,153,918
129 4,153,919

CLASS 361

3 4,153,922
40 4,153,921
48 4,153,923
94 4,153,924
323 4,153,925

CLASS 362

35 4,153,926
99 4,153,927
331 4,153,928
348 4,153,929

CLASS 363

42 4,153,930

CLASS 364

200 4,153,931
4,153,932
4,153,933
4,153,934
461 4,153,935
4v3 4,153,936
706 4,153,937
760 4,153,938
770 4,153,939
900 4,153,941
4,153,942
4,153,943
4,153,944
4,153,945
4,153,946

CLASS 365

6 4,153,947
28 4,153,948
104 4,153,949
231 4,153,950
239 4,153,951

CLASS 366

142 4,153,372
165 4,153,373
208 4,153,374
275 4,153,375
298 4,153,376
317 4,153,377

CLASS 400

196.1 4,153,378

CLASS 401

50 4,153,379

CLASS 405

39 4,153,380
173 4,153,381

CLASS 406

28 4,153,304

CLASS 408

10 4,153,382
26 4,153,383
115 R 4,153,384

CLASS 414

133 4,153,165
317 4,153,727
442 4,153,169
695 4,153,166
786 4,153,168

CLASS 415

53 R 4,153,385
115 4,153,386
219 C 4,153,387

CLASS 416

61 4,153,388
93 R 4,153,389
138 4,153,390

CLASS 417

269 4,153,391
372 4,153,392
429 4,153,393
571 4,153,394

CLASS 418

9 4,153,395
38 4,153,396
48 4,153,397
102 4,153,400

CLASS 422

56 4,153,668

CLASS 423

24 4,153,669
189 4,153,670
244 4,153,671
287 4,153,672
359 4,153,673
531 4,153,628
573 4,153,674

CLASS 424

8 4,153,675
9 4,153,676
19 4,153,677
44 4,153,678
45 4,153,679
49 4,153,680
72 4,153,681
78 4,153,682
85 4,153,683
88 4,153,684
94 4,153,685
176 4,153,686
177 4,153,687
4,153,688
178 4,153,689
195 4,153,690
230 4,153,691
245 4,153,692
246 4,153,693
247 4,153,694
251 4,153,695
253 4,153,696
258 4,153,697
4,153,698
4,153,699
4,153,700
261 4,153,701
263 4,153,702
267 4,153,703
270 4,153,704
4,153,705
4,153,706
272 4,153,707
273 B 4,153,709
273 P 4,153,710
4,153,711
4,153,712
273 R 4,153,708
274 4,153,713
4,153,714
4,153,715
4,153,716
275 4,153,717
4,153,718
282 4,153,719
283 4,153,720
285 4,153,721
304 4,153,722
4,153,723
308 4,153,724
309 4,153,725
313 4,153,726
319 4,153,728
325 4,153,729
330 4,153,730
337 4,153,731

CLASS 425

59 4,153,398
72 S 4,153,409
78 4,153,399
134 4,153,401
145 4,153,402
159 4,153,403
256 4,153,404
338 4,153,405
438 4,153,406
446 4,153,407
532 4,153,408

CLASS 426

72 4,153,732
4,153,733
250 4,153,734
285 4,153,735
302 4,153,736
548 4,153,737
656 4,153,738

CLASS 427

2 4,153,739
8 4,153,740
38 4,153,741
126 4,153,742
136 4,153,743
160 4,153,744
244 4,153,745
304 4,153,746

CLASS 428

40 4,153,747
57 4,153,748
95 4,153,749
107 4,153,750
304 4,153,751
379 4,153,752
409 4,153,753
539 4,153,754
569 4,153,755
653 4,153,756
661 Re.29,989

CLASS 429

47 4,153,757
98 4,153,758
147 4,153,759
252 4,153,760

CLASS 431

5 4,153,410

CLASS 432

27 4,153,411

CLASS 521

26 4,153,761
53 4,153,762
60 4,153,763
155 4,153,764
4,153,768

CLASS 526

48.1 4,153,765
59 4,153,766
141 4,153,767
195 4,153,769
209 4,153,770
221 4,153,771
308 4,153,772
4,153,773
352.2 4,153,774

CLASS 528

45 4,153,775
49 4,153,776
60 4,153,777
76 4,153,778
176 4,153,779
198 4,153,780
274 4,153,781
302 4,153,782
337 4,153,783
338 4,153,784
347 4,153,785
408 4,153,786
500 4,153,787

CLASS 536

8 4,153,788

CLASS 544

143 4,153,789
161 4,153,790
4,153,791
181 4,153,792
320 4,153,793
358 4,153,794

CLASS 546

2 4,153,795
7 4,153,601
22 4,153,604
37 4,153,602
120 4,153,796
142 4,153,603
237 4,153,797
264 4,153,605

CLASS 548

305 4,153,798
4,153,800
312 4,153,801
378 4,153,799

CLASS 560

21 4,153,802
57 4,153,803
121 Re.29,990
183 4,153,804
240 4,153,805
246 4,153,806

CLASS 562

469 4,153,807
503 4,153,808
583 4,153,809

CLASS 568

574 4,153,635
630 4,153,810
684 4,153,636
820 4,153,811

CLASS 585

405 4,153,637
526 4,153,638

CLASSIFICATION OF DESIGNS

D2— 308 251,756
311 251,757
381 251,758
D6— 20 251,759
71 251,760
251,761
251,762
105 251,763
183 251,764
D7— 62 251,765
70 251,766
208 251,767
D8— 7 251,768
58 251,769
367 251,770
382 251,771
D9— 175 251,772
D10— 38 251,773
81 251,774
251,775
D11— 30 251,776
160 251,777
D12— 70 251,778
D13— 13 251,779
15 251,780
24 251,781
D14— 6 251,782
12 251,783
45 251,784
84 251,785
D15— 12 251,786
52 251,787
D16— 14 251,788
32 251,789
D19— 1 251,790
75 251,791
91 251,792
D20— 29 251,815
D21— 20 251,811
36 251,812
114 251,814
118 251,813
D23— 18 251,793
23 251,794
58 251,795
77 251,796
97 251,797
D24— 1.1 251,798
251,799
251,800
D25— 17 251,801
22 251,802
26 251,803
60 251,804
63 251,805
74 251,806
79 251,807
80 251,808
D28— 13 251,809
251,810

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

4 :	4,153,522		4,152,821		4,153,672		4,153,818	18 :	4,152,816		4,153,765
6 :	Re.29,984		4,152,868		4,153,682		4,153,824		4,152,854	23 :	4,152,828
	Re.29,987		4,152,877		4,153,747		4,153,883		4,152,881	24 :	4,152,796
	4,152,787		4,152,891		4,153,768		4,153,915		4,152,952		4,152,871
	4,152,823		4,152,895		4,153,783		4,153,945		4,152,954		4,153,042
	4,152,833		4,152,902		4,153,809	13 :	4,153,168		4,152,965		4,153,190
	4,152,853		4,152,934		4,153,813	15 :	4,152,865		4,152,988		4,153,224
	4,152,979		4,152,955		4,153,823	16 :	4,152,808		4,153,019		4,153,244
	4,153,007		4,152,966		4,153,853	17 :	4,152,782		4,153,067		4,153,251
	4,153,278		4,152,967		4,153,871		4,152,797		4,153,279		4,153,287
	4,153,380		4,152,977		4,153,900		4,152,852		4,153,559		4,153,331
	4,153,384		4,152,992		4,153,909		4,152,862		4,153,595		4,153,473
	4,153,511		4,153,003		4,153,917		4,152,864		4,153,671		4,153,533
	4,153,657		4,153,006		4,153,929		4,152,874		4,153,695		4,153,680
	4,153,764		4,153,015		4,153,933		4,152,878		4,153,701		4,153,899
	4,153,837		4,153,037		4,153,949		4,152,906		4,153,709		4,153,946
	4,153,849		4,153,038		4,153,951		4,152,932		4,153,730	25 :	Re.29,989
	4,153,938		4,153,039	08 :	4,152,928		4,152,980		4,153,732		Re.29,992
8 :	4,153,298		4,153,050		4,153,051		4,152,991		4,153,850		4,152,824
	4,153,299		4,153,074		4,153,110		4,153,009		4,153,887		4,152,825
	4,153,300		4,153,084		4,153,247		4,153,017		4,153,926		4,153,049
9 :	4,152,938		4,153,088		4,153,288		4,153,046		4,153,928		4,153,076
	4,153,095		4,153,092		4,153,297		4,153,055		4,153,936		4,153,082
	4,153,172		4,153,113		4,153,434		4,153,086	19 :	4,152,792		4,153,162
	4,153,174		4,153,120		4,153,435		4,153,096		4,152,840		4,153,249
	4,153,386		4,153,132		4,153,476		4,153,117		4,153,073		4,153,254
	4,153,549		4,153,134		4,153,552		4,153,125		4,153,129		4,153,293
	4,153,643		4,153,161		4,153,735		4,153,155		4,153,143		4,153,335
	4,153,651		4,153,164		4,153,816		4,153,159		4,153,289		4,153,347
	4,153,841		4,153,170		4,153,881		4,153,173		4,153,318		4,153,353
	4,153,866		4,153,176	09 :	4,152,836		4,153,175	20 :	4,152,985		4,153,362
	4,153,898		4,153,181		4,152,910		4,153,205		4,153,104		4,153,363
01 :	4,153,282		4,153,194		4,152,920		4,153,218		4,153,255		4,153,365
	4,153,787		4,153,227		4,153,005		4,153,239		4,153,266		4,153,366
04 :	4,152,812		4,153,245		4,153,008		4,153,268		4,153,376		4,153,396
	4,152,922		4,153,281		4,153,056		4,153,324		4,153,752		4,153,416
	4,153,028		4,153,302		4,153,089		4,153,354	21 :	4,152,789		4,153,462
	4,153,154		4,153,314		4,153,193		4,153,361		4,153,188		4,153,543
	4,153,163		4,153,315		4,153,368		4,153,421		4,153,243		4,153,605
	4,153,222		4,153,328		4,153,597		4,153,456		4,153,437		4,153,631
	4,153,264		4,153,391		4,153,831		4,153,499		4,153,580		4,153,666
	4,153,777		4,153,398	10 :	4,152,886		4,153,534	22 :	4,152,795		4,153,675
	4,153,877		4,153,411		4,153,621		4,153,535		4,152,817		4,153,749
	4,153,927		4,153,443	12 :	Re.29,991		4,153,593		4,152,838		4,153,845
	4,153,942		4,153,475		4,152,826		4,153,700		4,152,924		4,153,870
06 :	Re.29,986		4,153,482		4,152,860		4,153,758		4,153,109		4,153,872
	4,152,783		4,153,483		4,152,882		4,153,769		4,153,152		4,153,886
	4,152,784		4,153,514		4,153,137		4,153,797		4,153,158		4,153,891
	4,152,786		4,153,529		4,153,189		4,153,826		4,153,206		4,153,903
	4,152,791		4,153,546		4,153,321		4,153,857		4,153,221		4,153,912
	4,152,793		4,153,556		4,153,346		4,153,878		4,153,451		4,153,921
	4,152,801		4,153,626		4,153,383		4,153,893		4,153,690		4,153,930
	4,152,807		4,153,670		4,153,403		4,153,918		4,153,757		4,153,932

26 : 4,152,822
4,152,834
4,152,861
4,152,876
4,152,890
4,152,944
4,152,945
4,152,949
4,152,953
4,152,981
4,153,014
4,153,025
4,153,030
4,153,058
4,153,085
4,153,133
4,153,142
4,153,145
4,153,147
4,153,148
4,153,169
4,153,199
4,153,248
4,153,273
4,153,274
4,153,292
4,153,296
4,153,308
4,153,313
4,153,389
4,153,399
4,153,418
4,153,466
4,153,481
4,153,548
4,153,571
4,153,579
4,153,581
4,153,612
4,153,636
4,153,642
4,153,707
4,153,717
4,153,868
27 : 4,152,863
4,153,012
4,153,059
4,153,156
4,153,160
4,153,178
4,153,196
4,153,232
4,153,275
4,153,393
4,153,412
4,153,457
4,153,488
4,153,619
4,153,654
4,153,661
4,153,716
4,153,721
4,153,873
4,153,943
4,153,947
29 : 4,152,790
4,152,897
4,153,138
4,153,183
4,153,229
4,153,270
4,153,286
4,153,303
4,153,907
32 : 4,153,471
33 : 4,153,496
4,153,821
4,153,888
4,153,892
34 : 4,152,788
4,152,900
4,152,909
4,152,927
4,152,958
4,152,964
4,153,020
4,153,080
4,153,146
4,153,250
4,153,252
4,153,291
4,153,305
4,153,317
4,153,329
4,153,330
4,153,343
4,153,377
4,153,422
4,153,423
4,153,424
4,153,446
4,153,448
4,153,491
4,153,493
4,153,523
4,153,527
4,153,562
4,153,563
4,153,564
4,153,565
4,153,566
4,153,568
4,153,574
4,153,576
4,153,578
4,153,584
4,153,585
4,153,588
4,153,589
4,153,594
4,153,611
4,153,615
4,153,632
4,153,633
4,153,634
4,153,662
4,153,665
4,153,678
4,153,706
4,153,711
4,153,725
4,153,738
4,153,739
4,153,741
4,153,744
4,153,761
4,153,773
4,153,790
4,153,791
4,153,799
4,153,805
4,153,811
4,153,835
4,153,843
4,153,856
4,153,862
4,153,865
4,153,894
4,153,940
4,153,944
35 : 4,153,430
36 : 4,152,803
4,152,805
4,152,848
4,152,851
4,152,856
4,152,859
4,152,873
4,152,899
4,152,907
4,152,911
4,152,937
4,152,948
4,152,951
4,153,011
4,153,040
4,153,052
4,153,062
4,153,098
4,153,102
4,153,107
4,153,130
4,153,135
4,153,150
4,153,153
4,153,197
4,153,201
4,153,204
4,153,210
4,153,241
4,153,257
4,153,277
4,153,369
4,153,374
4,153,428
4,153,429
4,153,432
4,153,459
4,153,486
4,153,510
4,153,512
4,153,528
4,153,532
4,153,537
4,153,590
4,153,616
4,153,639
4,153,641
4,153,668
4,153,677
4,153,719
4,153,737
4,153,802
4,153,806
4,153,817
4,153,860
4,153,914
4,153,950
37 : 4,152,885
4,153,054
4,153,409
4,153,660
4,153,863
38 : 4,153,114
39 : 4,152,818
4,152,819
4,152,839
4,152,950
4,152,963
4,152,984
4,153,016
4,153,075
4,153,141
4,153,166
4,153,167
4,153,184
4,153,186
4,153,217
4,153,230
4,153,235
4,153,246
4,153,260
4,153,262
4,153,319
4,153,392
4,153,397
4,153,405
4,153,426
4,153,438
4,153,449
4,153,464
4,153,495
4,153,539
4,153,592
4,153,598
4,153,625
4,153,648
4,153,653
4,153,667
4,153,743
4,153,771
4,153,792
4,153,825
4,153,874
4,153,890
40 : 4,152,929
4,153,066
4,153,119
4,153,310
4,153,373
4,153,536
4,153,538
4,153,649
4,153,851
41 : 4,152,858
4,153,070
4,153,237
4,153,518
42 : 4,152,827
4,152,903
4,152,905
4,152,943
4,152,986
4,152,996
4,153,060
4,153,090
4,153,136
4,153,171
4,153,228
4,153,234
4,153,325
4,153,326
4,153,348
4,153,406
4,153,414
4,153,436
4,153,489
4,153,520
4,153,526
4,153,540
4,153,545
4,153,572
4,153,586
4,153,635
4,153,638
4,153,655
4,153,659
4,153,720
4,153,722
4,153,740
4,153,776
4,153,785
4,153,786
4,153,808
4,153,812
4,153,820
4,153,828
43 : 4,153,045
44 : 4,153,285
45 : 4,152,846
4,152,904
4,152,961
4,153,261
4,153,567
47 : 4,152,975
4,153,370
4,153,441
4,153,779
4,153,782
48 : 4,152,845
4,152,855
4,152,926
4,152,936
4,152,971
4,152,973
4,153,047
4,153,072
4,153,097
49 : 4,152,941
4,153,071
50 : 4,152,969
51 : 4,152,933
4,153,043
4,153,547
4,153,855
4,153,931
53 : 4,152,987
4,153,144
4,153,202
4,153,225
4,153,381
4,153,885
54 : 4,153,427
4,153,455
4,153,509
4,153,516
4,153,623
4,153,778
4,153,923
55 : Re.29,990
4,152,809
4,152,820
4,152,847
4,152,884
4,152,960
4,152,974
4,153,000
4,153,036
4,153,044
4,153,087
4,153,139
4,153,504
4,153,555
4,153,664
4,153,751
4,153,840
4,153,924
4,153,941
56 : 4,152,842

DESIGN PATENTS

6 : 251,784
8 : 251,759
01 : 251,776
04 : 251,795
06 : 251,792
251,793
251,798
251,799
251,800
251,803
251,814
13 : 251,756
251,768
16 : 251,797
17 : 251,806
251,812
18 : 251,785
251,811
19 : 251,781
25 : 251,808
26 : 251,779
251,805
251,815
27 : 251,764
251,786
251,791
29 : 251,766
32 : 251,757
251,758
33 : 251,772
251,796
34 : 251,789
36 : 251,774
251,782
251,788
37 : 251,767
251,801
251,802
39 : 251,780
251,804
45 : 251,794
47 : 251,761
251,778
48 : 251,763
251,777
51 : 251,790

U.S. GOVERNMENT PRINTING OFFICE : O - 1979

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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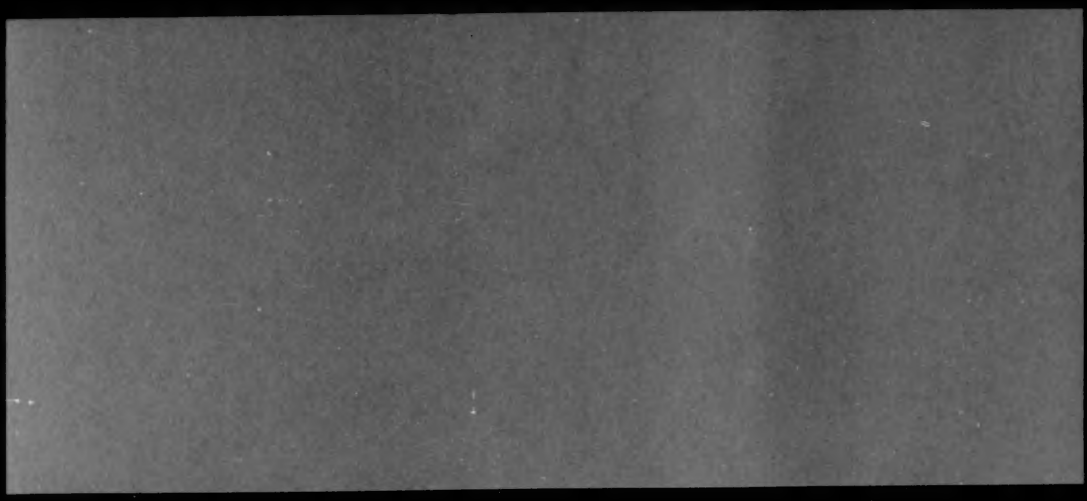

U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, Secretary

PATENT AND TRADEMARK OFFICE
Donald W. Banner, Commissioner